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CATALOGUE

OF THE

FISHES

IN THE

BRITISH MUSEUM.

BY

ALBERT GÜNTHER, M.A., M.D., Ph.D., F.Z.S.,

ETC. ETC.

VOLUME FOURTH.

LONDON:
PRINTED BY ORDER OF THE TRUSTEES.
1862.

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CATALOGUE

OF THE

ACANTHOPTERYGII PHARYNGOGNATHI

AND

ANACANTHINI

IN THE

COLLECTION

OF THE

BRITISH MUSEUM.

BY

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NOTICE.

The account of the Collection of Fishes in the British Museum having extended beyond the limits indicated on the title-pages of the first three volumes, it has become necessary to give a title referring to the whole of the work. Therefore, separate title-pages, which, in binding the work, are to be placed at the head of their respective volumes, have been issued with the present volume.

PREFACE.

Dr. Günther observes,—"This volume contains the *Pharyngognathi acanthopterygii* and the *Anacanthini* of Müller. In the preface to the third volume, I have expressed my doubts whether the Orders established by that great anatomist are natural groups of fishes; and I fully share the opinion of those who do not consider the coalesced pharyngeal bones as a character of sufficient importance to unite acanthopterous and malacopterous fishes into one Order. Placing the structure of the fins above that of the pharyngeals, I have changed the name of *Pharyngognathi acanthopteri* into *Acanthopterygii pharyngognathi*.

"The *Anacanthini* coincide essentially with the *Malacopterygii jugulares* of the old authors, and they appear to me to be a very natural order. The difference in general appearance between a Codfish and a Sole, indeed, is great,—so great, as to induce some ichthyologists to consider them as representatives of distinct Orders; but the absence of symmetry in the latter will be seen to be the only constant character on which such an opinion can be founded; and this character is but little developed in the higher-organized *Pleuronectidæ*, as in *Psettodes*. In this genus the want of symmetry is nearly entirely limited to the position of the eyes, which are on the right side in one half of the specimens of the same species, and on the left in the other. On the other hand, the Gadoids and Pleuronectoids agree in the great development of the dorsal and anal fins, in the position of the ventrals, and in the increased number of caudal vertebræ.

"No general account of the *Chromides* and of the *Anacanthini* has been given for the last fifty years, and at that time only a small number of species were known. Therefore, although I believe that this volume will be particularly useful to zoologists, I must ask their indulgence for the imperfection of a work in a field which hitherto has been so much neglected. The total number of species in this volume amounts to 1090, 890 of which are apparently well characterized.

"Of the numerous and valuable additions to the National Collection which have been received in the course of the last year, I may mention the following as the more important:—

"1. A Collection of *Pharyngognathi* and *Anacanthini* from the East Indian Archipelago, illustrative of the species described by Dr. P. v. Bleeker in his forthcoming great work on the Ichthyology of the East Indian Archipelago, published by the Dutch Government.

"2. A Collection of Freshwater and Marine Fishes from Guatemala, made by O. Salvin, Esq. and F. Godman, Esq.

"3. A large Collection of the Fishes of the Upper Nile, made by J. Petherick, Esq., H.M. Consul at Chartoum.

"4. A second and third Collection from Madeira, presented by J. Y. Johnson, Esq.

"5. A Collection of Scandinavian Fishes, presented by Hr. A. W. Malm of Göthaburg.

"6. A Collection of Mediterranean species (South of France), presented by Th. Günther, M.D.

"7. A Collection of Mediterranean Fishes, made at Malta by Dr. G. Gulia.

"8. A Collection of Freshwater and Marine species from Southern Spain, presented by Dr. P. L. Sclater, F.R.S.

"9. A Collection of Freshwater and Marine species from Port Natal, made by Mr. Th. Ayres.

"10. A Collection of Marine Fishes from Bahia, made by Dr. O. Wucherer.

"11. A Collection of Marine Fishes from Sydney, presented by G. Krefft, Esq.

"12. A Collection of Californian Fishes, presented by W. O. Ayres, M.D.

"Finally, I return my best thanks to Dr. P. v. Bleeker and to Prof. Gill of Washington, who have materially assisted me by communicating at an early date manuscripts or proof-sheets of their latest labours before their actual publication."

JOHN EDWARD GRAY.

British Museum,
June 15, 1862.

ADDITIONS

TO THE

INDEX OF THE WORKS

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* Of this work, which will be the standard work for Indian Ichthyology, four parts have been published during the printing of this volume, namely, pages 1 to 120, and plates 1 to 48. By the author's kindness, I have had the advantage of consulting the proof-sheets to page 164, which will be found quoted in the latter portion of this volume.

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ERRATA.

Page 64. Read *Heliastes marginatus* instead of *Heliastes marginata.*

Page 108. In the synonymy of *Cossyphus rufus*, read *Labrus rufus*, L., instead of *Turdus rufus*, L.

CATALOGUE

OF

FISHES.

Subclass I. TELEOSTEI.

(CONTINUED.)

Order II.
ACANTHOPTERYGII PHARYNGOGNATHI.

The inferior pharyngeal bones are coalesced, with or without a median longitudinal suture. Part of the rays of the dorsal, anal and ventral fins not articulated, forming spines. Air-bladder without pneumatic duct.

Cfr. Müller, in Berl. Abhandl. 1844, p. 166.

Synopsis of the Families.

Pseudobranchiæ present; gills three and a half; scales ctenoid	1. **Pomacentridæ**, p. 2.
Pseudobranchiæ present; gills three and a half; scales cycloid..............	2. **Labridæ**, p. 65.
Pseudobranchiæ present; gills four; scales cycloid, anal rays numerous........	3. **Embiotocidæ**, p. 244.
Pseudobranchiæ present; gills four; anal rays in small number...............	4. **Gerridæ**, p. 252.
Pseudobranchiæ none................	5. **Chromides**, p. 264.

Fam. 1. POMACENTRIDÆ.

Sciænoidei, pt., *Cuv. Règne Anim.*
Labroidei ctenoidei, *Müll. Berl. Abhandl.* 1844, p. 201.
Ctenolabridæ, *Owen, Lect. Comp. Anat. Fishes,* p. 48.

Body compressed, more or less short, covered with ctenoid scales. Dentition feeble, palate smooth. The lateral line does not extend to the caudal fin or it is interrupted. One dorsal fin, with the spinous portion as well developed as the soft, or more. Two, sometimes three, anal spines; the soft anal similar to the soft dorsal. Ventral fins thoracic, with one spine and five soft rays. Branchiostegals five, six, or seven; gills three and a half; pseudobranchiæ and air-bladder present. Pyloric appendages in small number; intestinal tract of moderate length. Vertebræ 12/14.

This family has great similarity to the *Chætodontidæ* proper, with regard to their mode of life and to their geographical distribution. The species are most numerous in the tropical parts of the Indian Ocean and Pacific, and are represented by several forms in the tropical portions of the Atlantic,—a few extending northwards to the Mediterranean and Japan, southwards to the coasts of South Australia, and eastwards to the Pacific coasts of America. They feed chiefly on small marine animals; and those with compressed teeth appear to feed on the small zoophytes or even on marine plants covering the coral-banks round which the *Pomacentridæ* and *Chætodontidæ* abound.

Synopsis of the Genera.

All the opercles and the præorbital are denticulated. Teeth conical, in a single series...........................	1. Amphiprion, p. 2.
Præorbital terminating in a very long and strong spine.	2. Premnas, p. 10.
Only the præoperculum and, sometimes, the præorbital are serrated. Teeth in a band. L. lat. less than 30.	3. Dascyllus, p. 11.
Præoperculum serrated; infraorbital bones hidden. L. lat. more than 30	4. Lepidozygus, p. 15.
Only the præoperculum and, generally, the præorbital are serrated. Teeth compressed, in a single series. L. lat. less than 30	5. Pomacentrus, p. 16.
None of the opercles serrated. Teeth compressed, in a single series. L. lat. 30 or less	6. Glyphidodon, p. 34.
None of the opercles serrated. Teeth compressed, in a single series. L. lat. more than 30	7. Parma, p. 57.
None of the opercles serrated. Teeth conical...........	8. Heliastes, p. 60.

1. AMPHIPRION.

Coracinus, sp., *Gronov. Zoophyl.* p. 66.
Amphiprion, sp., *Bl. Schn.* p. 47.
Amphiprion, *Cuv. & Val.* v. p. 384.

All the opercles and the præorbital are denticulated, the teeth of the operculum and suboperculum being very long. Teeth in a single series, small, conical. Dorsal fin with nine to eleven spines, anal with two. Scales rather small; the lateral line ceases below the end of the dorsal fin. Branchiostegals five; gills three and a half; pseudobranchiæ present; an air-bladder. Pyloric appendages two or three.

All the Indian seas. Western parts of the Pacific.

Synopsis of the Species.

a. Three or two white cross-bands, that below the dorsal fin being produced backwards along the upper part of the soft dorsal.

1. A. bifasciatus.
2. A. intermedius.
3. A. trifasciatus.
4. A. sebæ.

b. Three white cross-bands, the middle of which is not bent backwards above.

5. A. clarkii.
6. A. xanthurus.
7. A. chrysogaster.
8. A. fusciventer.
9. A. percula.

c. Two white cross-bands, the posterior not bent backwards above.

10. A. bicinctus.
11. A. chrysopterus.

d. A single cross-band.

12. A. melanopus.
13. A. tricolor (A. frenatus, *Brev.*).
14. A. rosenbergii.
15. A. perideraion.

e. No cross-band.

16. A. akallopisus.
17. A. ephippium.

1. **Amphiprion bifasciatus.**

Percis, sp., *Kölreut. N. Comm. Petrop.* x. p. 340. tab. 8. fig. 4.
? Sciæna, sp., *Gronov. Mus. Ichth.* p. 38.
? Coracinus, sp., *Gronov. Zoophyl.* no. 227.
Anthias bifasciatus, *Bl.* tab. 316. fig. 2.
Amphiprion bifasciatus, *Bl. Schn.* p. 204; *Cuv. & Val.* v. p. 392; *Schleg. Overz. Amphipr. &c. in Verh. Ned. Overz. Bezitt.* p. 18; *Bleek. Amb. & Cer.* p. 282.
Holocentrus bifasciatus. *Bl. Schn.* p. 567.
Lutjanus jourdin, *Lacép.* iv. pp. 191, 235.
Amphiprion laticlavius, *Cuv. & Val.* v. p. 296. pl. 132. fig. 1.
? Coracinus vittatus, *Gronov. Syst. ed. Gray*, p. 57.

D. $\frac{11}{13-15}$. A. $\frac{2}{12-13}$. L. lat. 50–55. L. transv. $\frac{6-7}{17-19}$.

Brownish-black, with two broad white cross-bands: the anterior from the nape of the neck to the interoperculum, touching the posterior margin of the orbit; the posterior spanning from between the two or three last dorsal spines to the eighth soft ray, and produced superiorly towards the posterior upper angle of the soft dorsal fin. Caudal fin black, with a broad white upper and lower margin. The dorsal spines are stout and short, the fourth being the longest, whilst the posterior ones decrease in length. The height of the body is somewhat less than one half of the total length (the caudal fin not included).

East Indian Archipelago; New Guinea.

Var. *bifasciata*: the posterior cross-band extends downwards to the vent. L. lat. 50. L. transv. 5/17.

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.

Var. *laticlavia*: the posterior cross-band extends downwards only to below the lateral line. L. lat. 55. L. transv. 7/19.

c–d. Adult and half-grown. East Indies. From the E. I. Collection.

2. **Amphiprion intermedius.**

Sciæna, var., *Gronov. Mus. Ichthyol.* p. 39.
Amphiprion intermedius, *Schleg. l. c.* p. 18.
—— trifasciatus, *Bleek. Celeb.* iii. p. 767 (not *Cuv. & Val.*).

D. $\frac{10-11}{14}$. A. $\frac{2}{13}$. L. lat. 55. L. transv. 6/19.

Brownish-black, with three broad white cross-bands: the anterior from the nape of the neck to the inter- and sub-operculum, touching the posterior margin of the orbit; the middle spanning from between the two last dorsal spines to the sixth soft ray, and produced superiorly towards the posterior upper angle of the soft dorsal fin; the third across the free portion of the tail and the base of the caudal fin. Caudal fin black, with a broad white upper and lower margin. The dorsal spines are stout and short, the third and fourth being the longest, whilst the posterior ones decrease in length. The height of the body is two-fifths of the total length (the caudal fin not included).

Molucca Sea.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.
b. Fine specimen. Purchased of Mr. Frank.
c. Skin. From Gronow's Collection.

This species is, perhaps, only a variety of *A. bifasciatus*.

3. **Amphiprion trifasciatus.**

Cuv. & Val. v. p. 395.

B. 5. D. $\frac{11}{14}$. A. $\frac{2}{13}$.

Brownish-black, with three broad white cross-bands, the two anterior of which are united by a horizontal line running along the base of the spinous dorsal; the second produced posteriorly towards the posterior angle of the dorsal fin. Caudal fin uniform brown, without white margin. (*Cuv.*)

Molucca Sea.

4. **Amphiprion sebæ.**

Seba, iii. p. 70. tab. 26. fig. 24.
Amphiprion sebæ, *Bleek. Batav.* p. 478.

D. $\frac{10}{14-15}$. A. $\frac{2}{12}$. L. lat. 46–55. L. transv. 6/20.

Black, with two white cross-bands, the posterior of which is produced superiorly towards the hinder angle of the soft dorsal fin; the free portion of the tail and the caudal yellow; muzzle light-brownish; pectoral blackish, the other fins black; anal edged with white. The dorsal fin is deeply notched and has its spines stout and short. The height of the body is rather less than one-half of the total length (the caudal fin not included).

Seas of Batavia and Sumatra.

a. Fine specimen. Sumatra. Purchased of Mr. Frank.

5. **Amphiprion clarkii.**

Anthias clarkii, *Benn. Fish. Ceyl.* pl. 29.
Amphiprion clarkii, *Cuv. & Val.* ix. p. 504; *Peters in Wiegm. Arch.* 1855, p. 265.
—— japonicus, *Schleg. Faun. Japon. Poiss.* p. 66.
—— chrysargurus, *Richards. Ichth. Chin.* p. 254.
—— xanthurus, *Bleek. Amboina,* ii. p. 560 (not *Cuv. & Val.*).
? Amphiprion polymnus, *Steindachner, Verhandl. Zool. Bot. Gesellsch. Wien,* 1861, p. 79.

B. 5. D. $\frac{10}{16}$. A. $\frac{2}{14}$. L. lat. 55. L. transv. 6/19.

Ground-colour brown or black, with three pearl-coloured cross-bands, the last round the tail; thorax and chin, pectoral, ventral and caudal fins yellow; dorsal fin black. The dorsal fin is scarcely notched and has the spines stout and short. The height of the body is rather less than one-half of the total length (caudal not included); the caudal fin is emarginate.

From the coast of Mozambique to China.

Var. *α*. Anal fin yellowish, with blackish margin.

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.
c. Fine specimen. Singapore.
d. Half-grown. Mozambique. From Prof. Peters's Collection.
e. Adult. China. Presented by F. R. Reeves, Esq.
f. Adult. China.
g, h, i, k. Adult, half-grown, and young.

Var. *β*. Anal fin black.

l. Adult. China. Presented by F. R. Reeves, Esq.
m. Adult: stuffed. China. Presented by F. R. Reeves, Esq.—Type of *A. chrysargyrus*.

6. **Amphiprion xanthurus.**

Cuv. & Val. v. p. 402; *Bleek. Batav.* p. 480 (not *Amboina,* ii. p. 560).

D. $\frac{10}{15}$. A. $\frac{2}{14}$. L. lat. 50.

Scarcely different from *A. clarkii.*

Black, with three broad pearl-coloured cross-bands, the middle of which is not produced on to the upper margin of the soft dorsal.

Snout orange-coloured; pectoral and caudal fins yellow, the former blackish at the base; the other fins deep-black.

Ile de France. Batavia.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

7. Amphiprion chrysogaster.

Cuv. & Val. v. p. 400; *Less. Voy. Coqu. Zool. Poiss.* p. 191. pl. 28. fig. 3; *Cuv. Règne Anim. Ill. Poiss.* pl. 32. fig. 1; *Guér. Iconogr.* iii. pl. 19. fig. 2.

D. $\frac{10}{17}$. A. $\frac{2}{14}$. L. lat. 55. L. transv. 6/18. Cæc. pylor. 2.

Brownish-black, with three white cross-bands, and with the thorax, pectoral and ventral fins yellowish; the soft dorsal and caudal with a white edge, the pectoral with a broad blackish margin. The dorsal spines are rather stout and moderately long, the third and fourth being the longest, whilst the posterior ones decrease in length. The height of the body is one-half of the total length (the caudal fin not included).

Ile de France. Bourbon.

a. Fine specimen. Mauritius. From the Collection of the Zoological Society.

b. Adult: stuffed.

8. Amphiprion fusciventer.

? Anthias polymnus, *Bl.* taf. 316. fig. 1.
? Amphiprion polymnus, *Bl. Schn.* p. 203; *Cuv. & Val.* v. p. 396.
? Lutjanus polymnus, *Lacép.* iv. p. 224.
Amphiprion fusciventer, *Benn. Proceed. Comm. Zool. Soc.* i. p. 165.

D. $\frac{10}{17}$. A. $\frac{2}{14}$. L. lat. 52. L. transv. 6/18.

Brownish-black, with three rather narrow whitish cross-bands, that round the tail being very indistinct; caudal fin with a rather broad white posterior margin, dorsal and anal with a narrow whitish edge. Pectorals brownish; the outer half of the ventrals black, the inner white. Dorsal fin slightly notched, with the spines of moderate strength and length; the third, fourth and fifth are the longest. Caudal fin rounded. The height of the body is rather less than one-half of the total length (the caudal fin not included).

Sea of Mauritius.

a. Six inches long. From the Collection of the Zoological Society. —Type of the species.

9. Amphiprion percula.

Tetragonopterus, no. 5, *Klein, Pisc. Miss.* iv. p. 38. tab. 11. fig. 8.
Seba, iii. p. 69. tab. 26. fig. 20.
Perca, sp., *Tyson in Philos. Trans.* lxi. p. 247. tab. 7. fig. 8.
Anthias polymna, var., *Bl.* tab. 316. fig. 3.
Lutjanus polymnus, var., *Lacép.* iv. p. 224.

Lutjanus percula, *Lacép.* iv. pp. 239, 248.

Amphiprion percula, *Cuv. & Val.* v. p. 397; *Bleek. Amb. & Cer.* p. 287; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 19; *Steindachner, Verhandl. Zool. Bot. Gesellsch. Wien*, 1861, p. 78.

—— tunicatus, *Cuv. & Val.* v. p. 399. pl. 132. fig. 2; *Less. Voy. Coqu. Zool. Poiss.* p. 192. pl. 25. fig. 3.

—— ocellaris, *Cuv. & Val.* v. p. 399.

—— melanurus, *Cuv. & Val.* v. p. 400.

D. $\frac{11}{15}$. A. $\frac{2}{12}$. L. lat. 55. L. transv. 7/23.

Ground-colour light-brown or brown, with three broad white cross-bands, edged with black: the anterior is curved and encircles completely the hind part of the head, its convexity being directed backwards; the middle descends from the notch of the dorsal fin to the vent, and is angularly produced on the middle of the side; the posterior round the free part of the tail: fins with a black and white margin. The dorsal spines are moderately strong and long; the posterior ones, however, are much shorter than those on the middle, there being a deep notch between the spinous and the soft dorsal fin. The height of the body is two-fifths of the total length (the caudal not included).

From the seas of China to those of Australia.

Var. *α*. Ground-colour light-brown; the fins are nearly white within the black edges. (*A. polymnus*, var., Bl.)

a–b. Fine specimens. China Sea. Presented by Vice-Admiral Sir E. Belcher, C.B.

c–f. Fine specimens. Sumatra. From the Collection of Sir T. S. Raffles.

Var. *β*. Ground-colour brown; the vertical fins are of the same colour as the body, within the black edge. (*A. melanurus*, C. & V.; *A. ocellaris*, C. & V.)

g–h. Fine specimens. Amboyna. Purchased of Mr. Frank.

i. Half-grown. Sumatra. From the Collection of Sir T. S. Raffles. —Type of *A. melanurus*.

k. Half-grown. Sumatra. From the Collection of Sir T. S. Raffles. —Type of *A. ocellaris*.—The large whitish ocellus, on account of which Cuvier, relying on the examination of Valenciennes, has created this nominal species, is a mark produced by the chemical action of some fluid, and visible only on one side of the fin.

Var. *γ*. Ground-colour brown; between the two anterior bands blackish-brown: *A. tunicatus*.

Var. *δ*. Ground-colour dark-brown, the black edges of the cross-bands and fins being rather indistinct.

l, m–p. Adult, half-grown, and young.

10. Amphiprion bicinctus.

Rüpp. Atl. Fische, p. 139. taf. 35. fig. 1; *Cuv. & Val.* ix. p. 505.

B. 5. D. $\frac{10}{16}$. A. $\frac{2}{14}$. L. lat. 58. L. transv. 8/20.

Brown, with two white cross-bands, one across the head and neck, the other across the middle of the body; the soft dorsal is greenish, the others yellow, the ventral having the outer margin brown. Caudal fin emarginate, sometimes with the upper lobe produced. Dorsal fin scarcely notched, with the spines of moderate strength and length. The height of the body is one-half or a little more than one-half of the total length (the caudal fin not included).

Red Sea.

a, b–c. Adult. Red Sea. Collected and presented by Dr. E. Rüppell.

11. Amphiprion chrysopterus.

Cuv. & Val. v. p. 401.

Black, with two pearl-coloured cross-bands; anterior part of the head, thorax and fins orange-coloured; the caudal fin alone is reddish-grey and has the lobes somewhat prolonged.

Hab. —— ?

This fish is known from a figure only, and is closely allied to *A. bicinctus.*

12. Amphiprion melanopus.

Bleeker, Amboina, ii. p. 561.

D. $\frac{10}{17}$. A. $\frac{2}{14}$. L. lat. 48–50. L. transv. 5/18.

Brownish-black, lighter anteriorly, with a pearl-coloured band from the neck to the opercles; tail yellow posteriorly; ventral and anal fins black; dorsal, caudal and pectoral fins yellow. Dorsal spines moderately strong. The height of the body is one-half of the total length (the caudal fin not included).

Sea of Amboyna.

a–b. Fine specimens. Amboyna. Purchased of Mr. Frank.

13. Amphiprion tricolor.

D. $\frac{10}{16-17}$. A. $\frac{2}{14-15}$. L. lat. 56. L. transv. 7/19.

Blackish-brown: thorax, all the lower parts and the free portion of the tail dull-orange-coloured; a pearl-coloured band, edged with black, from the nape of the neck across the opercles. Ventral, anal and caudal dull-orange-coloured, the two former edged with black—the ventral exteriorly, the anal inferiorly. Præorbital and præoperculum strongly serrated. The dorsal fin is nearly even, the middle and posterior spines having about the same length. Caudal rounded. The height of the body is one-half of the total length (the caudal fin not included).

Total length $3\frac{1}{2}$ inches.

Port Essington.

a–g. Port Essington. From the Haslar Collection.
h. Port Essington. Presented by the Earl of Derby.
i. South Australia.

This fish is, perhaps, identical with a very imperfectly known Japanese species; it has been called *Amphiprion frenatus*. A thoroughly incorrect figure may be seen in the 'Narrative of an Expedition of an American Squadron to the China Seas and to Japan,' pl. 6. fig. 4, where (p. 263) the colours are stated to be a rich dark-violet, pale-red below; an ultramarine-blue stripe from the base of the first dorsal spine, obliquely forwards below the eye and over the præopercle, terminating near the throat; dorsal spines twelve.

Mr. Gill mentions this *A. frenatus* in Proc. Acad. Nat. Sc. Philad. 1860, p. 148. The colour of the preserved specimens was tawny; the oblique band behind the eye purplish-white, edged with black. Dorsal spines nine.

14. Amphiprion rosenbergii.

Bleeker, Act. Soc. Sc. Indo-Nederl. vi. *Nieuw-Guinea*, p. 16.

D. $\frac{10}{15}$. A. $\frac{2}{12}$.

Body and fins yellowish-orange-coloured; a broad white band round the whole head, behind the eye. Præoperculum slightly, præorbital not denticulated. The middle dorsal spines are the longest; caudal obtusely rounded. The height of the body is rather less than one-half of the total length (the caudal fin not included).

Coast of Dorch (New Guinea).

15. Amphiprion perideraion.

Bleeker, Groot Oby, p. 437.

D. $\frac{10}{16}$. A. $\frac{2}{13}$. L. lat. 55.

Orange-coloured, each scale with a bluish dot; a blue line commences on the middle of the forehead and runs along the base of the dorsal fin to the back of the tail; a narrow vertical pearl-coloured band on the opercles, edged with brown. Dorsal fin with a distinct notch and with the spines of moderate length and strength, the third, fourth and fifth being the longest; caudal fin subtruncated. The height of the body is two-fifths of the total length (the caudal fin not included).

Seas of Groot Oby and Amboyna.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

16. Amphiprion akallopisus.

Bleeker, Sumatra, ii. p. 281, and *Groot Oby*, p. 438.

D. $\frac{9-10}{20-18}$. A. $\frac{2}{13}$. L. lat. 60.

Uniform orange-coloured, each scale with a bluish dot. A blue line commences on the middle of the forehead and runs along the base of the dorsal fin to the back of the tail. Dorsal fin with a slight notch superiorly.

Sea of Priaman.

a. From Dr. P. v. Bleeker's Collection.

17. Amphiprion ephippium.

Prochilus, sp., *Klein, Pisc. Miss.* v. p. 60. tab. 12. fig. 1.
Chætodon, sp., *Seba*, iii. p. 70. tab. 26. fig. 25.
Lutjanus ephippium, *Bl.* iv. p. 121. taf. 201. fig. 2; *Lacép.* iv. pp. 229, 230.
Amphiprion ephippium, *Bl. Schn.* p. 200; *Cuv. & Val.* v. p. 386; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 18; *Bleek. Batoe*, p. 321.
Coracinus insignitus, *Gronov. Syst. ed. Gray*, p. 57.

D. $\frac{10-11}{17-15}$. A. $\frac{2}{14}$. L. lat. 55. L. transv. 7/18. Cæc. pylor. 2.

Wholly dirty-yellowish (in spirits), with a very large brown blotch below the dorsal fin, and extending nearly to the anal fin; ventral fin with the outer margin brownish. The spinous dorsal is rather low, with the five posterior spines longest. The height of the body is one-half of the total length (the caudal not included).

Indian Ocean and Archipelago.

a. Fine specimen.

2. PREMNAS.

Premnas, *Cuv. Règne Anim.*

All the opercles are serrated, the præorbital terminating in a very strong and long spine posteriorly. Teeth small, conical, in a single series. Dorsal fin with nine or ten spines, anal with two. Scales small; the lateral line ceases below the end of the dorsal fin. Branchiostegals five or six; gills three and a half; pseudobranchiæ present; an air-bladder. Pyloric appendages three.

East Indian Archipelago.

1. Premnas biaculeatus.

Premnas biaculeatus, *Bleek. Banda*, iii. p. 105.

Var. *α*.

Premnas leucodesmus, (*Kuhl & v. Hass.*) *Cuv. & Val.* v. p. 409.

Var. *β*.

Renard, Poiss. Mol. i. pl. 22. fig. 122.
Percis, sp., *Kölreut. in Nov. Comm. Petrop.* x. p. 346. tab. 8. fig. 5.
Chætodon biaculeatus, *Bl.* taf. 219. fig. 2.

Lutjanus trifasciatus, *Bl. Schn.* p. 568.
Holacanthus biaculeatus, *Lacép.* iv. pp. 528, 537.
Holocentrus sonneratii, *Lacép.* iv. pp. 344, 391.
Scorpæna aculeata, *Lacép.* iii. pp. 258, 268.
Premnas trifasciatus, *Cuv. & Val.* v. p. 405; *Cuv. Règne Anim. Ill. Poiss.* pl. 32. fig. 2; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 20. tab. 6. fig. 6; *Bleek. Verhand. Batav. Genootsch.* xxi. *Labr. Cten.* p. 9.

Var. γ.

Premnas semicinctus, *Cuv. & Val.* v. p. 409. pl. 133. fig. 1; *Bleek. Verhand. Batav. Genootsch.* xxi. *Labr. Cten.* p. 7; *Guér. Iconogr. Règne Anim.* iii. pl. 19. fig. 5.

Var. δ.

Chætodon, sp., *Seba*, iii. tab. 26. fig. 19.
Premnas unicolor, *Cuv. & Val.* v. p. 410.
Sargus ensifer, *Gronov. Syst. ed. Gray*, p. 66.

B. 5–6. D. $\frac{9\text{–}10}{18\text{–}16}$. A. $\frac{2}{14\text{–}15}$. L. lat. 60–70. Cæc. pylor. 3.
Vert. $\frac{12}{14}$.

Reddish-brown; fins with a black margin. Generally three pearl-coloured cross-bands.

East Indian Archipelago.

Var. α. The bands encircle the whole body, and the second and third are produced on the middle of the side into a process pointing forwards.

Var. β. The bands encircle the whole body, and have no process anteriorly.

a. Fine specimen. Ceram. From the Collection of Frau Ida Pfeiffer.
b. Half-grown. Philippine Islands.
c. Adult female: skeleton. Amboyna. Purchased of Mr. Frank.

Var. γ. The bands do not descend beyond the middle of the side.

Var. δ. The bands are very indistinct.

d. Adult: skin. From Gronow's Collection.

3. DASCYLLUS.

Dascyllus, *Cuv. Règne Anim.*
Tetradrachmum, *Cant. Mal. Fish.* p. 240.

Præoperculum and sometimes the præorbital serrated. Teeth small, villiform, in a narrow band, with an outer series of somewhat larger ones. Dorsal fin with twelve or thirteen (in *D. polyacanthus* with seventeen) spines, anal with two. Scales of moderate size, in less than thirty transverse series. The lateral line ceases below the soft dorsal fin. Branchiostegals five; gills three and a half; pseudobrânchiæ present; air-bladder large. Pyloric appendages two or three.

From the eastern coasts of Africa to Polynesia and New Zealand.

1. Dascyllus aruanus.

Valent. Amb. iii. p. 501. fig. 489; *Renard*, i. fig. 165; *Seba*, iii. 26. 23.
Chætodon arcuatus, *L. Mus. Ad. Fried.* tab. 33. fig. 8; *Shaw, Zool.* iv. p. 341.
—— aruanus, *L. Syst. Nat.* i. p. 464; *Bl.* iii. p. 62. tab. 198. fig. 2; *Bl. Schn.* p. 220; *Shaw, Zool.* iv. p. 348.
Tetragonopterus, no. 6, *Klein, Pisc. Miss.* iv. p. 38. tab. 11. fig. 9.
Chætodon abu dafur, *Forsk.* p. 15.
Lutjanus aruanus, *Lacép.* iv. p. 720.
Pomacentrus aruanus, *Rüpp. Atl. Fische*, p. 39.
Dascyllus aruanus, *Cuv. & Val.* v. p. 434; *Bleek. Banda*, i. p. 246 (not variety), and *Banda*, iii. p. 108.
Chætodon araneus, *Benn. Ceyl. Fish.* pl. 17.
Tetradrachmum arcuatum, *Cant. Mal. Fish.* p. 241.

D. $\frac{12}{12}$. A. $\frac{2}{12}$. L. lat. 26–27. L. transv. 3/9. Cæc. pylor. 3. Vert. 12/14.

Three black cross-bands: the first descending obliquely from the origin of the spinous dorsal fin through the orbit to the chin, leaving a greyish patch on the forehead; the second slightly curved, from the sixth to ninth dorsal spines to the ventral fins, which are black; the third from the soft dorsal to the anal; dorsal and anal fins black, caudal whitish.

From the eastern coasts of Africa to Polynesia and New Zealand.

a. Red Sea. From the Berlin Museum.
b. Adult. Pinang. From Dr. Cantor's Collection.
c. Adult: stuffed. Pinang. From Dr. Cantor's Collection.
d–h. Adult and half-grown. Amboyna.
i. Adult. Molucca Sea. Purchased of Mr. Frank.
k. Half-grown. East Indies. From the Collection of the East India Company.
l–m. Adult. China Seas. Presented by Vice-Admiral Sir E. Belcher, C.B.
n–t. Adult and half-grown. Feejee Islands. Voyage of the 'Herald.'
u. Fine specimen. Tongataboo. Presented by Sir E. Home.
v–β, *γ–δ*. Adult and half-grown. Tonga Islands. From the Haslar Collection.
ε. Adult. New Zealand. Presented by Sir J. Richardson.
ζ–η. Half-grown. South Sea.
θ–κ, *λ–μ*, *ν–ξ*, *ο*. Adult and half-grown.
π. Adult: skeleton. Amboyna.

2. Dascyllus melanurus.

Dascyllus aruanus, var., *Bleek. Banda*, i. p. 246.
—— melanurus, *Bleek. Banda*, iii. p. 109.

D. $\frac{12}{11\text{–}12}$. A. $\frac{2}{12}$. L. lat. 27–28.

Yellowish, with three black cross-bands: the first descending vertically from the crown of the head through the orbit to the chin; the second straight and vertical, from the six first dorsal spines to the ventral fins, which are entirely black; the third from the soft dorsal fin to the anal; dorsal and anal fins black; caudal yellowish at the base and on the upper and lower margins, the remainder black.

East Indian Archipelago.

a. Fine specimen. Molucca Sea. Purchased of Mr. Jamrach.
b. Half-grown. Amboyna. Purchased of Mr. Frank.

3. **Dascyllus trimaculatus.**

Pomacentrus trimaculatus, *Rüpp. Atl. Fische*, p. 39. taf. 8. fig. 3.
—— nuchalis, *Benn. in Life of Raffles*, p. 688.
Dascyllus trimaculatus, *Cuv. & Val.* v. p. 441.
—— unicolor, *Benn. Proc. Comm. Zool. Soc.* i. p. 127.
—— niger, *Bleek. Verhand. Batav. Genootsch.* xxi. *Labr. Cten.* p. 10.
Sparus nigricans, pt., *Gronov. Syst. ed. Gray*, p. 61.

D. $\frac{12}{15}$. A. $\frac{2}{14}$. L. lat. 27. L. transv. 3/11. Cæc. pylor. 3. Vert. 11/14.

Blackish; vertical fins with a black margin. A single white spot on the nape of the neck (sometimes indistinct); another above the lateral line below the middle of the dorsal fin. The second dorsal spine is shorter than the head, and not twice as long as the last.

From the eastern coasts of Africa to the East Indian and Louisiade Archipelagos.

a. Adult. Red Sea. From Dr. Rüppell's Collection.
b. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.
c–e. Adult and half-grown: bad state. Mauritius. Presented by Vice-Admiral Sir E. Belcher, C.B.
f. Fine specimen. Mauritius. From the Collection of the Zoological Society.—Type of *Dascyllus unicolor*.
g. Adult. Mozambique. From Prof. Peters's Collection.
h. Half-grown. Sumatra. From the Collection of the Zoological Society.—Type of *Pomacentrus nuchalis*, Benn.
i, k. Fine specimen and young. Amboyna. Purchased of Mr. Frank.
l. Adult: stuffed. Louisiade Archipelago. Voyage of the 'Rattlesnake.'
m. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.
n. Adult: skin. From Gronow's Collection.
o. Adult: skeleton. Mozambique. From Prof. Peters's Collection.

The white lateral spot becomes nearly obsolete in dried adult specimens, which then appear to be uniform brown. In the typical specimen of *D. unicolor* and in others there is no nuchal spot, and the lateral spot is indistinct, although clearly indicated.

4. **Dascyllus albisella.**

Gill in Proc. Acad. Nat. Sc. Philad. 1862, p. 149.

D. $\frac{12}{16}$. A. $\frac{2}{15}$. L. lat. 27. L. transv. 5/12.

Dark greyish, with a transverse white band, descending halfway down from the middle of the back below the fifth and tenth dorsal spines. All the fins, except the pectorals, are very dark. The second dorsal spine is as long as the head, and about twice as long as the last. (*Gill.*)

Sandwich Islands.

Evidently closely allied to *D. trimaculatus.*

5. **Dascyllus marginatus.**

Pomacentrus marginatus, *Rüpp. Atl. Fische,* p. 38. taf. 8. fig. 2.
Dascyllus marginatus, *Cuv. & Val.* v. p. 439. pl. 133. fig. 2; *Lefebvre, Voy. Abyss.* vi. p. 231; *Guér.-Ménev. Iconogr.* iii. pl. 19. fig. 6.

D. $\frac{12}{15}$. A. $\frac{2}{13}$. L. lat. 25. L. transv. 3/12.

Head and thorax grey; back and tail yellowish, with a bluish streak on each scale; tail with a blue superior and inferior margin; dorsal and anal fins with black margins; ventrals black; caudal transparent.

Red Sea.

a, b. Adult. Red Sea. From Dr. Rüppell's Collection.
c. Adult. Red Sea. From the Berlin Museum.
d. Adult: not good state.

6. **Dascyllus xanthosoma.**

Dascyllus xanthosoma, *Bleek. Banda,* i. p. 247.
—— marginatus, var., *Steindachner, Verhandl. Zool. Bot. Gesellsch. Wien,* 1861, p. 77.

D. $\frac{12}{15}$. A. $\frac{2}{13}$. L. lat. 25.

Yellow, with a brown band from the back to the pectoral fin; each scale with a small blue streak; ventrals black; anal brownish; the other fins greenish, sometimes with a darker margin.

East Indian Archipelago.

a. Borneo. Purchased of Mr. Frank.
b. Bleached. From the Haslar Collection.

Heliases reticulatus (Richards. Ichth. Chin. p. 254) is described as follows:—

D. $\frac{12}{15}$. A. $\frac{2}{13}$. L. lat. 25. L. transv. 11–12.

"The profile, leaving out part of the tail, is nearly orbicular. Teeth in one row, short, subulate, acute, with very minute ones behind, scarcely perceptible even through a lens. Narrow præorbital scaly, and, when examined by a lens, seen to be minutely toothed, as is also the vertical limb of the præoperculum, a few teeth at the corner of this bone being larger. Caudal slightly notched at the end. After long maceration in spirits, the ground-colour is milk-white, with a well-defined pale-yellowish-brown border to each scale, producing a network with acutely elliptical meshes."

China Seas.

The typical specimens appear to be lost; the characters given in the description indicate that this fish does not belong to *Heliastes*; it appears to be identical with *D. xanthosoma*.

The "Pomacentre gros yeux," Liénard, Dixième Rapp. Soc. Hist. Nat. Maur. p. 34, also appears to be identical with this species.

7. **Dascyllus cyanurus.**

? Pomacentrus viridis, *(Ehrenb.) Cuv. & Val.* v. p. 420.
Dascyllus cyanurus, *Rüppell, N. W. Fische*, p. 127. taf. 31. fig. 4.

D. $\frac{12}{9-11}$. A. $\frac{2}{10-12}$. Cæc. pylor. 2.

The height of the body is nearly one-third of the total length. Green: tail blue; operculum with some blue spots; a black spot at the base of the pectoral; the other fins reddish.

Massaua.

8. **Dascyllus polyacanthus.**

Bleeker, Natuurk. Tydschr. Nederl. Ind. ix. p. 503, and *Act. Soc. Sc. Indo-Nederl.* ii. *Amboina*, p. 71.

D. $\frac{17}{13-14}$. A. $\frac{2}{15-16}$. L. lat. 32–33. L. transv. 3/11.

Teeth of the upper jaw in a double, of the lower in a single series. Caudal fin forked. Brownish, sometimes with darker spots; pectorals yellow, the other fins brown.

Coasts of Sangi, Batjan, and Amboyna.

a. Four and a half inches long. From Dr. P. v. Bleeker's Collection.

4. LEPIDOZYGUS.

Pomacentrus, sp., *Bleeker*.

Præoperculum serrated; præorbital distinct, the other suborbitals and the præopercular limbs hidden by scales. Teeth small, subconical, in a single series. Dorsal fin with about twelve spines, anal with two. Scales of moderate size, in more than thirty transverse series.

Sea of Ternate.

This genus is separated from *Pomacentrus* on account of the increased number of scales, a character accompanied by quite a peculiar physiognomy and by a different dentition.

1. **Lepidozygus tapeinosoma.**

Pomacentrus tapeinosoma, *Bleeker, Ternate*, vii. p. 376.

D. $\frac{12}{14}$. A. $\frac{2}{15}$. L. lat. 36. L. transv. 3/9.

The height of the body is one-fourth or rather more than one-fourth of the total length. Præoperculum slightly serrated. The posterior and middle dorsal spines are nearly equal in length; caudal fin forked. Olive, with blue dots; fins immaculate.

Sea of Ternate.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

5. POMACENTRUS *.

Pomacentrus, (*Lacép.*) *Cuv. & Val.* v. p. 412.
Pristotis, *Rüpp. N. W. Fische*, p. 128.

Præoperculum and, generally, the infraorbital ring serrated; operculum with one or two small spines. Teeth small, compressed, with the crown entire or slightly emarginate, in a single series. Dorsal fin with twelve or thirteen spines, anal with two. Scales of moderate size, in less than thirty transverse series; the lateral line ceases below the soft dorsal fin. Branchiostegals five; gills three and a half; pseudobranchiæ present; an air-bladder. Pyloric appendages three.

Tropical seas of both hemispheres; more abundant in the Indian Seas and in Polynesia.

One of the characters mentioned, viz. the serrature of the præoperculum and præorbital, is subject to variation according to the age of the individual. The serrature, especially of the præorbital, is less distinct or entirely absent in young individuals of a species which has that bone strongly denticulated in the mature state; in other species the præorbital does not appear to be serrated in any stage of development. A similar change extends also to the præoperculum in some species; and such young individuals as show neither the præorbital nor the præoperculum serrated may be easily mistaken for Glyphidodonts. If we consider moreover that the colours also are subject to variation, we may well be cautious in describing new species of these two genera. The British Museum possesses a number of such young specimens, which we are unable to refer to any known species. Several of the species established by Cuvier and enumerated in the following list are apparently founded on young individuals, and will prove to be identical with others.

Synopsis of the Species.

A. Body with broad cross-bands, or with large blotches across the back.

a. Those markings are permanent in every age, p. 17.

1. P. robustus.
2. P. annulatus.
3. P. nematopterus.
4. P. bifasciatus.
5. P. albofasciatus.
6. P. fasciatus.
7. P. trimaculatus.
8. P. chrysopœcilus.

b. Those markings disappear in mature age, p. 20.

9. P. notophthalmus.

B. Body uniform, or with small dots or fine and short streaks.

a. The height of the body is one-third or less than one-third of the total length.

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* 1. Pomacentrus emarginatus, *Cuv. & Val.* v. p. 422; *Less. Voy. Coqu. Zool. Poiss.* p. 189. pl. 28. fig. 1.—Waigiou.
2. —— brachialis, *Cuv. & Val.* v. p. 420.—Java.
3. —— pictus, *Casteln. l. c.* pl. 2. fig. 1.—Brazil.
4. —— ater (Pomacentre noir), *Liénard, Dixième Rapp. Soc. Hist. Nat. Maurit.* p. 34.—Mauritius.
5. —— atrocyaneus, *Poey, Mem. Cub* ii. p. 190.—Cuba.

* Caudal lobes or some rays of the vertical fins produced into filaments, p. 20.

10. P. violascens.
11. P. cyanomus.
12. P. polynema.
13. P. cyanostigma.
14. P. tæniurus.

** None of the rays of the vertical fins are prolonged, p. 22.

15. P. simsiang.
16. P. pavo (pavoninus)
17. P. prosopotænia (perspicillatus).
18. P. cæruleus.
19. P. melanotus.
20. P. melanopterus.
21. P. obtusirostris.

b. The height of the body is more than one-third of the total length.

* Blue lines along the nape and the forehead, p. 25.

22. P. trilineatus.
23. P. tæniometopon.
24. P. bankanensis.
25. P. rectifrænum.
26. P. quadrigutta.

** Forehead without longitudinal lines, p. 28.

27. P. rhodonotus.
28. P. scolopsis.
29. P. dorsalis.
30. P. chrysurus.
31. P. punctatus.
32. P. cyanospilus.
33. P. moluccensis.
34. P. interorbitalis.
35. P. leucostictus.
36. P. fuscus.
37. P. otophorus.
38. P. xanthurus.
39. P. littoralis (katunko).
40. P. tripunctatus.
41. P. vanicolensis.
42. P. planifrons.
43. P. nigricans.
44. P. latifrons.

1. **Pomacentrus robustus.**

D. $\frac{13}{13}$. A. $\frac{2}{11}$. L. lat. 28. L. transv. 4/10.

The height of the body is two-fifths of the total length (one-half, without caudal), the length of the head one-fourth. The upper profile, from the origin of the dorsal fin to the snout, is a regular curve; interorbital space convex, wider than the orbit. Præorbital not serrated, nearly as wide as the orbit; præoperculum finely denticulated. The dorsal spines are of moderate length and strength, the third, fourth and fifth being the longest, two-fifths of the length of the head; the posterior spines are only half the length of the middle soft rays; the soft dorsal fin is higher than long. Caudal fin shorter than the head, slightly emarginate, with the lobes obtusely rounded. The second anal spine is very strong, and as long as the fourth of the dorsal fin. The first ventral ray is produced into a very short filament. Greenish-olive, the scales on the lower parts of the sides having a light centre; seven or six blackish-brown cross-bands, broader than the ground-colour between them: the first is ill defined, across the head; the second from the nape and origin of the dorsal to the base of the pectoral, which has a black spot superiorly in its axil; the third, fourth and fifth from below the spinous dorsal; the sixth from the soft dorsal fin to the end of the anal; the seventh is indistinct, across the back of the tail. Ventral fin blackish, the first soft ray white along the outer margin.

Hab. ——?

a. Fine specimen, six inches long. From the Haslar Collection.

2. Pomacentrus annulatus.

Peters in Wiegm. Arch. 1855, p. 265.

D. $\frac{13}{12}$. A. $\frac{2}{12}$. L. lat. 27. L. transv. 2/9.

The height of the body is contained twice and two-thirds in the total length; præorbital without, præoperculum with a rather indistinct serrature. The middle dorsal spines are somewhat longer than the posterior ones. Caudal fin emarginate. Yellow, with five black cross-bands, the first through the eye, and the last round the root of the caudal fin.

Coast of Mozambique.

a. Half-grown. Mozambique. From Prof. Peters's Collection.

3. Pomacentrus nematopterus.

Pristotis trifasciatus, *Bleek. Journ. Ind. Archipel.* ii. p. 637.
Pomacentrus nematopterus, *Bleek. Amboina & Ceram,* p. 285.

D. $\frac{13}{11}$. A. $\frac{2}{12}$. L. lat. 28. L. transv. 2/9.

The height of the body is contained twice and one-third in the total length (the caudal filament not included); præorbital not serrated, præoperculum indistinctly denticulated. The posterior dorsal spine longer than the others; the sixth ray of the dorsal fin, the eighth of the anal, and the caudal lobes produced into filaments (in mature specimens). Yellowish, with three broad brownish-violet cross-bands: the first through the eye; the second triangular, from the back to the base of the pectoral; the third towards the anal fin, terminating on the middle of the side. Most of the scales with a bluish spot; the soft dorsal greenish, with blue dots; anal yellow; caudal with violet dots arranged in cross-series.

East Indian Archipelago.

a, b. Half-grown.
c. Young. From Dr. P. v. Bleeker's Collection.

4. Pomacentrus bifasciatus.

Bleek. Floris, p. 330.

D. $\frac{13}{14}$. A. $\frac{2}{14}$. L. lat. 25.

The height of the body is rather more than one-third of the total length; præorbital not serrated. Caudal emarginate, with the lobes rounded. Yellowish, with a broad black band from the neck to the opercles, and with a second on and below the posterior dorsal spines; præorbital with a blue curved line; fins yellow. (*Bl.*)

Floris, Ternate, Booroo.

a. Eighteen lines long: bad state. From Dr. P. v. Bleeker's Collection.

5. Pomacentrus albofasciatus.

Pomacentrus albofasciatus, *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 21.
—— leucopleura, *Bleek. Sumatra,* iv. p. 85.

D. $\frac{12}{15}$. A. $\frac{2}{13}$. L. lat. 26. L. transv. 3/9.

The height of the body is contained twice and two-thirds or thrice in the total length; præorbital not serrated. The posterior and middle spines of the dorsal fin are nearly of the same length; caudal forked. Dark-olive, with a broad yellowish band across the middle of the body, below the posterior dorsal spines; a curved bluish line below the eye; a blackish spot on the base of the hinder dorsal rays and on the base of the pectoral.

East Indian Archipelago.

a. Twenty-eight lines long. From Dr. P. v. Bleeker's Collection.

6. Pomacentrus fasciatus.

Cuv. & Val. v. p. 426. pl. 134; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 20. tab. 4. fig. 1; *Bleek. Batav.* p. 482; *Guér. Iconogr. Règne Anim.* pl. 19. fig. 7.

B. 5. D. $\frac{12\text{–}13}{13}$. A. $\frac{2}{12\text{–}13}$. L. lat. 27. L. transv. 3/9.

The height of the body is contained twice and three-fourths in the total length; præorbital denticulated. The dorsal spines increase in length posteriorly; caudal very slightly emarginate. Brown, lighter beneath, with four yellow cross-bands: one from the neck to the operculum, the second from the front part of the dorsal fin to behind the axil of the pectoral, the third from the posterior dorsal spines, and the fourth, spot-like, on the back of the tail; two parallel series of black spots from the opercle along the side of the trunk.

East Indian Archipelago.

a. Fine specimen. Ceram. From Mr. Stevens's Collection.
b. Adult. Philippine Islands.
c. Half-grown. Presented by Sir J. Richardson.

7. Pomacentrus trimaculatus.

Cuv. & Val. v. p. 320; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 20. tab. 4. fig. 2; *Bleek. Batav.* p. 481 (not *Rüpp.*).

D. $\frac{13}{13}$. A. $\frac{2}{14}$. L. lat. 28.

The height of the body is one-third or rather less than one-third of the total length; præorbital serrated. The dorsal spines increase in length towards behind; caudal emarginate. Greenish or violet, with two or three large blackish spots on the back; two bluish lines from one orbit to the other; the scales on the base of the vertical fins with a bluish dot; anal with one blue longitudinal stripe, dorsal fin with two.

East Indian Archipelago. China.

a. Adult. China. Presented by Sir J. Richardson.

8. Pomacentrus chrysopœcilus.

Pomacentrus chrysopœcilus, (*Kuhl & van Hass.*) *Schleg. Overz. Amphipr. &c. in Verhand. Nederl. Overz. Bezitt.* p. 21. tab. 5. fig. 3; *Bleek. Amboina & Ceram*, p. 284.

Pomacentrus notostigmus. *Richards. Voy. Sulph. Ichth.* p. 89. pl. 44. figs. 1 & 2.

D. $\frac{13}{15}$. A. $\frac{2}{14}$. L. lat. 28. L. transv. $\frac{2}{9}$.

The height of the body is contained twice and three-fourths in the total length; præorbital serrated; the dorsal spines increase in length towards behind; caudal fin very slightly emarginate, with the upper lobe somewhat longer and more pointed than the lower. Brownish, with a large white spot on the back, below the middle of the spinous dorsal fin.

East Indian Archipelago.

a. Adult. Presented by Vice-Admiral Sir E. Belcher, C.B.—Type of *P. notostigmus*.

b. Half-grown. Purchased of Mr. Frank.

9. Pomacentrus notophthalmus.

Bleek. Natuurk. Tydschr. Nederl. Ind. iv. p. 137, and *Act. Soc. Sc. Indo-Nederl.* i. *Manado & Macass.* p. 51.

D. $\frac{13}{12-14}$. A. $\frac{2}{12}$. L. lat. 26. L. transv. $2\frac{1}{2}/9$.

The height of the body is contained twice and two-thirds to twice and four-fifths in the total length; præorbital strongly serrated in adult specimens and without serrature in young ones. The dorsal spines increase in length posteriorly; caudal fin emarginate, with the lobes rounded. Brownish, whitish below; tail yellow: immature specimens with a pearl-coloured cross-band below the anterior dorsal spines, and sometimes with a second below the soft dorsal fin. A black spot above the operculum; sides of the head with pearl-coloured dots. A large blackish ocellus, edged with yellow, between the eighth and eleventh dorsal spines, near the base. The other fins orange-coloured.

East Indian Archipelago.

a. Half-grown. From Dr. P. v. Bleeker's Collection.

10. Pomacentrus violascens.

Pristotis violascens. *Bleek. Contr. Ichth. Sumb. in Journ. Ind. Archipel.* ii. 1848, p. 637.

Pomacentrus violascens, *Bleek. Natuurk. Tydschr. Nederl. Ind.* vi. p. 318 & xii. p. 222.
Dascyllus xanthurus, *Bleek. Amboina,* iii. p. 117.

D. $\frac{13}{10}$. A. $\frac{2}{10}$. L. lat. 27.

The height of the body is two-sevenths or one-fourth of the total length; præorbital not serrated. The dorsal spines increase in length posteriorly; the middle rays of the dorsal and anal fins and the lobes of the caudal are more or less produced into filaments. Violet, silvery beneath; each scale with a vertical bluish streak; a large blue spot on the shoulder; the posterior part of the tail with the caudal and the hindmost portion of the dorsal yellow; anal yellowish. (Cfr. *Glyphidodon bankieri* or *nemurus*, p. 54.)

Seas of Nias and Sumbawa.

a. Adult: fine specimen. From Dr. P. v. Bleeker's Collection as *Dascyllus xanthurus*.
b. Half-grown: not good state. From Dr. P. v. Bleeker's Collection as *Pomacentrus violascens*.

11. **Pomacentrus cyanomus.**

Bleek. Natuurk. Tydschr. Nederl. Ind. 1856, xi. p. 89.

D. $\frac{13}{11}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. 3/10.

The height of the body is contained twice or twice and a fifth in the length taken to the end of the dorsal fin, and thrice and two-thirds in the total. Præorbital not serrated. The posterior and middle dorsal spines are nearly equal in length; the soft dorsal, the anal, and the caudal lobes are produced into long filaments. A large violet spot at the origin of the lateral line, another in the inner part of the axil of the pectoral fin. Dorsal fin violet, with a blue longitudinal band, and with a yellowish spot on the base of the posterior rays; anal violet; caudal greenish, each lobe with a violet longitudinal band on the margin.

Seas of Java and Nias.

a. From Dr. P. v. Bleeker's Collection.

12. **Pomacentrus polynema.**

Bleek. Sumatra, ii. p. 283.

D. $\frac{13}{12}$. A. $\frac{2}{12}$. L. lat. 30.

The height of the body is two-sevenths of the total length; præorbital denticulated. The dorsal spines increase in length posteriorly; the dorsal and anal rays and the lobes of the caudal are produced into short filaments. Yellowish-violet, the scales on the head with a blue spot, those on the body with a blue vertical line; blue lines from the orbit to the maxillary; the spinous dorsal superiorly, and the anal between the single rays with blue streaks. (*Bl.*)

Sea of Priaman.

13. Pomacentrus cyanostigma.

Pristotis cyanostigma, *Rüpp. N. W. Fische*, p. 128. taf. 31. fig. 5.

D. $\frac{13}{11-12}$. A. $\frac{2}{13}$. Cæc. pylor. 2.

The height of the body is one-third of the total length (the caudal filament not included); the posterior dorsal spines are a little shorter than the anterior ones; caudal fin forked, with the upper lobe produced into a long filament; operculum with two spines. Greenish, dotted with blue; dorsal fin with two series of blue dots; caudal fin with transverse series; a blue streak from the orbit to the extremity of the snout; a black spot superiorly at the base of the pectoral. (*Rüpp.*)

Massaua.

14. Pomacentrus tæniurus.

Bleek. Act. Soc. Sc. Indo-Nederl. i. *Amboina*, p. 51.

D. $\frac{13}{11}$. A. $\frac{2}{11}$. L. lat. 28.

The height of the body is contained thrice and three-fourths to thrice and four-fifths in the total length; præorbital not serrated. The posterior dorsal spines are nearly as long as the middle ones; caudal fin with the lobes pointed and produced. Violet-olive, each scale with a pearl-coloured spot; a blackish spot above the operculum and above the base of the pectoral fin. Dorsal and anal fins dark-violet, the posterior half of the soft portion and the pectorals orange-coloured; caudal orange-coloured, with a dark-violet longitudinal band on each lobe.

Seas of Biliton and Amboyna.

a. Two inches long: bad state. From Dr. P. v. Bleeker's Collection.

This species is extremely similar to *Glyphidodon anabatoides* (p. 54)!

15. Pomacentrus simsiang.

Bleek. in Natuurk. Tydschr. Nederl. Ind. 1856, xi. p. 90.

D. $\frac{13}{14}$. A. $\frac{2}{14}$. L. lat. 26.

The height of the body is contained thrice and a quarter in the total length; præorbital not serrated. The dorsal spines increase in length posteriorly; caudal fin slightly emarginate. The upper part of the head and the anterior part of the back and the dorsal fin umber-brown; the remainder, the anal, caudal and the hindmost part of the dorsal yellow; each scale with one or three small blue spots or stripes; two blue lines along the forehead, convergent on the snout and ascending towards the back. Three oblique blue longitudinal stripes on each side of the head: one from the eye to the suprascapula, the second from the eye to the snout, and the third below the eye. A black ocellus edged with blue on the middle of the soft dorsal fin, near its base; anal edged with blue. (*Bl.*)

Sea of Batavia.

16. Pomacentrus pavo.

Chætodon pavo, *Bl.* t. 198. f. 1; *Bl. Schn.* p. 228.
Pomacentrus pavo, *Lacép.* iv. p. 508; *Rüpp. Atl. Fische,* p. 37; *Cuv. & Val.* v. p. 413; *Cuv. Règne Anim. Ill. Poiss.* pl. 32. fig. 3; *Bleek. Banda,* i. p. 247; *Peters in Wiegm. Archiv,* 1855, p. 265.
Holocentrus diacanthus, *Lacép.* iv. pp. 338, 373.

D. $\frac{13}{13}$. A. $\frac{2}{13-15}$. L. lat. 28–30.

The height of the body is contained thrice and a fourth or thrice and a third in the total length; the serrature of the præorbital is minute and inconspicuous; operculum with a single spine. The posterior dorsal spines are scarcely longer than the middle ones; caudal deeply emarginate, with the lobes pointed. Blue, each scale with a brown vertical streak. Belly and fins yellow, the former and the base of the dorsal and anal with blue dots; a brown spot on the scapula.
Molucca Sea. Coast of Mozambique.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

Pomacentrus pavoninus (Bleek. Solor, p. 85) has been separated by Dr. Bleeker from this species, because it has the lobes of the caudal fin rounded, like *P. prosopotænia*; but it is known from a single specimen only.

17. Pomacentrus prosopotænia.

Bleek. Singapore, p. 67.

D. $\frac{13}{14-15}$. A. $\frac{2}{14}$. L. lat. 28–29. L. transv. 3/9.

The height of the body is one-third of the total length; præorbital strongly serrated; the dorsal spines increase in length towards behind; caudal fin emarginate, with the lobes rounded. Greenish, each scale with a narrow vertical blue streak; a blue line across the præorbital and another between the orbits; a small blue ocellus at the origin of the lateral line; sides of the head and base of the dorsal and anal fins with blue dots, the latter with a blue line along and near the margin; axil of the pectoral blackish-violet.
Singapore. Molucca Sea.

a. Six inches long. Moluccas.
b. Half-grown. Amboyna. Purchased of Madame Ida Pfeiffer.
c. Adult: bad state. From the Haslar Collection.
d. Seven inches long. From Dr. Berthold Seemann's Collection.

Pomacentrus perspicillatus (Cuv. & Val. v. p. 417), with a brown spot between the seventh and ninth dorsal spines, is, perhaps, a variety of this species.

18. Pomacentrus cæruleus.

Quoy & Gaim. Voy. Uran. Zool. p. 397. pl. 64. fig. 2; *Cuv. & Val.* v. p. 418.

D. $\frac{13}{15}$. A. $\frac{2}{15}$ Cæc. pylor. 3. Vert. 11/15.

The height of the body is one-third of the total length; the dorsal spines increase in length towards behind; caudal fin emarginate, with the lobes rounded. Blue, with very numerous small vermiculated black lines which suppress one-half of the ground-colour on the upper parts of the sides; the spots are less numerous on the lower parts, each scale having a black dot at the base and three or four very small ones towards the margin. Vertical fins brownish-black, with series of blue dots, the outer series being formed by the largest dots.

Ile de France.

The above characters have been given on the authority of Cuvier, the description and figure by Quoy and Gaimard differing from each other and from Cuvier's account in several respects.

19. **Pomacentrus melanotus.**

Bleek. Act. Soc. Sc. Indo-Nederl. iii. *Celebes*, x. p. 13.

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 28.

The height of the body is one-third of the total length; præorbital serrated. The dorsal spines increase in length towards behind; caudal with the lobes rounded. The upper part of the head and the anterior part of the back brown, the posterior and all the lower parts yellow; sides of the head with whitish dots; operculum with a dark-brown spot superiorly. The dorsal fin is brownish-violet, with a golden intramarginal line, to the tenth spine, orange-coloured behind it; anal yellow, with a broad violet margin anteriorly; the other fins yellowish. (*Bl.*)

Sea of Manado.

20. **Pomacentrus melanopterus.**

Bleek. Amboina, ii. p. 562.

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 25. L. transv. 3/9.

The height of the body is one-third of the total length; præorbital not serrated. The dorsal spines become gradually longer posteriorly; caudal fin emarginate, with the upper lobe rather pointed. Greenish, fins blackish; base of the pectoral blackish. Brownish (in spirits), each scale with a shining transverse spot.

East Indian Archipelago, entering rivers.

a. Adult. From Dr. P. v. Bleeker's Collection.

21. **Pomacentrus obtusirostris.**

D. $\frac{13}{13}$. A. $\frac{2}{14}$. L. lat. 30. L. transv. $\frac{3-4}{9}$.

The height of the body is two-sevenths of the total length; snout obtuse, much shorter than the diameter of the orbit, the width of which is more than that of the interorbital space. There are only six small incisors anteriorly in the upper jaw, and eight in the lower, the lateral teeth being very small. Præorbital very narrow and not serrated; præoperculum finely serrated; operculum with two spines. The scales on the upper side of the head do not advance to the front margin of the orbit. Of the dorsal spines the fourth, fifth and sixth are the longest, the posterior ones being a little shorter; the soft dorsal and anal and the caudal lobes are produced into a point. Light-yellowish-olive (in spirits), dorsal fin blackish; a deep-black spot superiorly in the axil of the pectoral.

Hab. —— ?

a. Four inches long. Presented by Sir J. Richardson.
b. Two inches long. From the Haslar Collection.

22. Pomacentrus trilineatus.

Pomacentrus trilineatus, (*Ehrenb.*) *Cuv. & Val.* v. p. 428.
—— biocellatus, *Rüpp. N. W. Fische*, p. 127. tab. 31. fig. 3 (young, not good).

D. $\frac{13}{15}$. A. $\frac{2}{16}$. L. lat. 28. L. transv. 3/9.

The height of the body is contained twice and three-fourths in the total length; præorbital denticulated, with two stronger teeth anteriorly. The dorsal spines increase in length towards behind; caudal emarginate, with the lobes rounded. Greenish-olive (in spirits brown); the base of the caudal and the caudal itself yellowish; each scale with one, two or three sky-blue dots; three or five very fine blue lines along the forehead, the outer of which are continued on the nape of the neck and sometimes along the base of the dorsal fin; a round dark spot above the operculum; a black spot edged with blue on the back of the tail, immediately behind the dorsal fin; young specimens with a second similar spot on the anterior third of the soft dorsal fin.

Red Sea. Mozambique. Molucca Sea.

a–c. Adult, half-grown, and young. Red Sea. Collected and presented by Dr. Rüppell.
d. Adult. Massaua. From the Berlin Museum.
e. Fine specimen. Molucca Sea.
f–g, h, i. Adult and half-grown.

23. Pomacentrus tæniometopon.

Bleek. Amboina & Ceram, p. 283.

D. $\frac{13}{14\text{–}15}$. A. $\frac{2}{14\text{–}15}$. L. lat. 28. L. transv. 3/10.

The height of the body is contained twice and two-thirds in the total length; præorbital and suborbitals denticulated, with the anterior teeth not stronger. The dorsal spines increase somewhat in length towards behind; caudal emarginate, with the lobes rounded. Greenish-violet (in spirits brown); vertical fins darker posteriorly; scales without blue dots. A pair of very fine blue lines or series of dots along the forehead and the neck; a round dark spot above the operculum; sides of the snout with blue spots or streaks; no spot on the back of the tail.

East Indian Archipelago.

a. Four inches long. From Dr. P. v. Bleeker's Collection.

24. Pomacentrus bankanensis.

Pomacentrus tæniops, *Bleek. Banka*, ii. p. 729 (not *Cuv. & Val.*).
—— bankanensis, *Bleek. Sumatra*, iii. p. 513.

D. $\frac{13}{14}$. A. $\frac{2}{14-15}$. L. lat. 26–28. L. transv. 3/9.

The height of the body is contained twice and two-thirds in the total length; præorbital denticulated. The dorsal spines increase in length towards behind; caudal fin subtruncated. Brownish (in spirits), caudal yellow, each scale with a bluish dot; two bluish lines along the forehead, convergent on the snout and extending on to the back; two similar lines through the iris to the maxillary; a dark-blue spot superiorly on the operculum; a black ocellus edged with white on the base of the ninth, tenth and eleventh dorsal rays.

East Indian Archipelago. Sea of China.

a. China Sea. Presented by Vice-Admiral Sir E. Belcher, C.B.

? *b*. From Dr. P. v. Bleeker's Collection as *P. bankanensis*.—This specimen differs from the other and from Bleeker's description in several points: A. $\frac{2}{13}$; no blue lines on the upper side of the head; no blue dorsal ocellus. It is similar in coloration to *P. chrysurus*, Brouss.

25. Pomacentrus rectifrænum.

Pomacentrus rectifrænum, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 148.

D. $\frac{12}{15}$. A. $\frac{2}{14}$. L. lat. 26. L. transv. 3/10.

The height of the body is a little less than one-third of the total length; præorbital without, præoperculum with a very fine, and in young specimens without serrature. The lower præopercular limb scaly. The dorsal spines increase in length towards behind; caudal fin emarginate. Brownish, or bluish-olive, the scales on the back and above the anal with a bluish spot. Three or five blue streaks along the forehead and snout, the middle single one being sometimes indistinct, the outer pair a little deflexed behind the eyes and continued into a band or series of dots above the lateral line. No dark spot above the operculum; a black spot edged with bluish-white anteriorly, on the back of the tail, immediately behind the dorsal fin: young specimens with a whitish spot on the base of the last anal rays, and with a black ocellus anteriorly on the soft dorsal, both gradually disappearing with age.

Coasts of Lower California and Central America.

a. Thirty-four lines long. Cape St. Lucas. Presented by the Smithsonian Institution.—One of the types of *P. rectifrænum*, Gill.

b. Twenty-six lines long. Cape St. Lucas. Presented by the Smithsonian Institution.—One of the types of *P. bairdii*, Gill.
c. Twenty-four lines long. West coast of Central America. From Captain Dow's Collection. Presented by Dr. P. L. Sclater, Secr. Zool. Soc.
d–h. Adult, half-grown, and young. Island of Cordova. Presented by J. U. Skinner, Esq.

After having seen the variations of colours in *P. trilineatus*, *P. leucostictus*, and in many other species of this genus and of *Glyphidodon*, it is impossible for me to share Professor Gill's opinion as to the validity of three of the four species established by him in the 'Proceedings of the Philadelphia Academy,' *l. c.*, *P. rectifrænum*, *flavilatus*, and *bairdii*. I am not only indebted to that gentleman for the opportunity of examining typical specimens, but also for an account in MS., in which he distinguishes a fifth form among the numerous examples collected by Mr. Xantus at Cape St. Lucas. I am fully convinced that they are specifically identical, and that the differences pointed out by Professor Gill are dependent *chiefly* on age,—*P. rectifrænum* being the old, and *P. bairdii* the young state, whilst the other represents a variation of colours similar to that observed in *P. leucostictus*. However, in order not to omit anything which may assist others to form their own opinion, I insert the following characters assigned by Professor Gill to his species and kindly communicated to me by him for that purpose:—

"I. Two blue lines on upper surface of head continuous to occiput.
  α. Sides, pectoral, caudal, and dorsal and anal fins behind, yellowish .... *P. flavilatus.*
  β. Sides and fins coloured nearly as back.
    1. Ventrals and anal not margined; no dorsal ocellus nor anal spot .... *P. rectifrænum.*
    2. Ventrals, and anal in front, margined with blue; anal with a blue spot at base of last rays; dorsal ocellus .... *P. analigutta.*
II. Two blue lines from snout decurved behind eyes.
    1. Body uniformly coloured, with two dorsal spots; also one behind dorsal fin and one at base of last anal rays; occiput with a blue spot on each side .... *P. quadrigutta.*
    2. Body below and tail yellowish, without distinct spots; occiput with two parallel lontudinal blue lines, &c. .... *P. bairdii.*"

26. **Pomacentrus quadrigutta.**

Gill in Proc. Acad. Nat. Sc. Philad. 1862, p. 149.

D. $\frac{12}{15}$. A. $\frac{2}{14}$. L. lat. 26. L. transv. 3 10.

The height of the body is contained twice and two-thirds in the total length; præorbital not, præoperculum scarcely serrated; the lower præopercular limb is scaleless. The dorsal spines increase in length towards behind; caudal fin emarginate. Brownish, each scale blue in the centre; two blue streaks diverge from the snout and run along the upper margin of the orbit, their continuation on the nape appearing as an oblong bluish spot. Two distant bluish-white spots above the lateral line, one on the base of the last dorsal rays and one on the base of the last anal rays. A black spot edged with white anteriorly on the back of the tail; a similar superiorly at the root of the pectoral.

Lower California.

a. Eighteen lines long. Cape St. Lucas. Presented by the Smithsonian Institution.—One of the typical specimens.

Although this species is very similar to the preceding, I consider it as specifically different on account of its body being rather more elevated, and also on account of the scaleless lower limb of the præoperculum.

27. **Pomacentrus rhodonotus.**

Bleek. Sumatra, ii. p. 282.

D. $\frac{13}{15}$. A. $\frac{2}{15}$. L. lat. 24.

The height of the body is contained twice and two-thirds in the total length; præorbital not serrated. The dorsal spines increase in length towards behind; caudal fin emarginate, with the lobes rounded. The upper part of the head and the anterior part of the back brownish-red, the remainder blackish-violet. The spinous dorsal red; the soft dorsal violet, with a large black ocellus, edged with blue, between the last dorsal spine and the sixth ray; anal black. (*Bl.*)

Sumatra, Nias.

28. **Pomacentrus scolopsis.**

Pomacentrus scolopseus, *Quoy & Gaim. Voy. Uran. Zool.* p. 398.
—— tæniops, *Cuv. & Val.* v. p. 423; *Less. Voy. Coqu. Zool.* ii. p. 190. pl. 28. fig. 2; *Bleek. Sumatra,* iii. p. 512 (not *Banka,* ii. p. 729).
? —— emamo, *Less. l. c.* p. 190.

D. $\frac{12}{16-17}$. A. $\frac{2}{13-14}$. L. lat. 27. L. transv. 2/10. Vert. 12/15.

The height of the body is two-fifths of the total length; præorbital serrated. The posterior dorsal spines are scarcely longer than the middle ones; caudal fin slightly emarginate, with the lobes rounded. Blackish-brown, each scale with a silvery dot; a curved silvery line round the lower part of the orbit. A black spot on the base of the three last dorsal rays, and another superiorly in the axil of the pectoral.

Ile de France; East Indian Archipelago; Polynesia.

a–d. Half-grown. Feejee Islands. Voyage of the 'Herald.'
e. Half-grown. Presented by Dr. P. v. Bleeker.

29. Pomacentrus dorsalis.

Gill in Proc. Acad. Nat. Sc. Philad. 1859, p. 147.

D. $\frac{13}{15}$. A. $\frac{2}{15}$. L. lat. 25.

The upper profile of the head is straight. Præorbital obtusely denticulated. Brown, obscurely dotted with blue; a large black spot, edged anteriorly with bluish, on the posterior rays of the dorsal fin. A blackish spot superiorly on the operculum and another at the base of the pectoral; caudal fin yellow towards the base. The spot on the dorsal fin becomes indistinct with age; sometimes a blue streak round the lower part of the orbit.

Seas of Japan and China.

a. China. Presented by Vice-Admiral Sir E. Belcher, C.B.
b. From the Haslar Collection.

30. Pomacentrus chrysurus.

Chætodon chrysurus, *Broussonet.*
Pomacentrus chrysurus, *Cuv. & Val.* v. p. 423.

D. $\frac{13}{15}$. A. $\frac{2}{15}$. L. lat. 26. L. transv. 3/10.

The height of the body is contained twice and three-fourths in the total length. Snout rather shorter than the eye, the diameter of which is nearly one-third of the length of the head; interorbital space slightly convex, as broad as the orbit. Præorbital naked, half as broad as the orbit, with a shallow notch anteriorly and with a spinous tooth posteriorly; suborbital ring slightly serrated posteriorly; scales on the cheek in two series; the lower præopercular limb with another series of very small scales; præoperculum strongly serrated. Teeth narrow. The two last dorsal spines rather longer than the middle ones, three-fifths as long as the head; the soft dorsal and anal rounded; caudal fin emarginate, its length being a little more than one-fifth of the total. Brown: caudal yellow; the other fins blackish; sometimes a round black spot, edged anteriorly with bluish, near the base of the six last dorsal rays; an indistinct brown dot superiorly in the axil of the pectoral. No spot at the origin of the lateral line.

Amboyna.

a. Fine specimen, thirty lines long. Purchased of Mr. Frank.
b. Three inches long. Presented by J. B. Jukes, Esq.

31. Pomacentrus punctatus.

?? Chætodon lividus, *Forst. Descr. Anim. ed. Licht.* p. 227; *Bl. Schn.* p. 235.
Pomacentrus punctatus, *Quoy & Gaim. Voy. Uran. Zool.* p. 395. pl. 64. fig. 1; *Rüpp. Atl. Fische*, p. 37; *Cuv. & Val.* v. p. 429.

D. $\frac{12\text{–}13}{15\text{–}14}$. A. $\frac{2}{13\text{–}14}$. Cæc. pylor. 3.

The height of the body is contained twice and two-thirds in the total length. Præorbital denticulated, nearly as broad as long; caudal emarginate. Brownish: head with irregular bluish dots, the body with a blue spot on each scale. A black spot, edged with white anteriorly, on the back of the tail, immediately behind the dorsal fin; operculum with a dark spot above.

Red Sea; Ile de France; Bola Bola.

32. **Pomacentrus cyanospilus.**

Pomacentrus cyanospilos, *Bleek. Ceram.* ii. p. 709.
—— prosopotænioides, *Bleek. Amb. & Ceram*, p. 286.

D. $\frac{12}{15}$. A. $\frac{2}{13-14}$. L. lat. 26. L. transv. 3/9.

The height of the body is contained twice and two-thirds in the total length. There is no notch between the præorbital and the other suborbitals, their lower or posterior margin being equally and finely serrated. The dorsal spines become gradually longer posteriorly. Caudal rather deeply emarginate, with the lobes rounded. Brownish, sides of the head and the scales above the anal fin with round bluish spots; anal and dorsal fins very dark posteriorly; axillary or dorsal spots none.

East Indian Archipelago.

a. Five inches long. From Dr. P. v. Bleeker's Collection (*P. prosopotænioides*).
b. Twenty-three lines long. From Dr. P. v. Bleeker's Collection as *P. cyanospilos*.
c. Twenty-eight lines long. Amboyna. Purchased of Mr. Frank.

Dr. v. Bleeker has considered this species as identical with *P. punctatus*, Q. & G. (see Enumer. p. 87), but I prefer to keep them separate, as the latter species has a black caudal ocellus according to the accounts of Gaimard, Cuvier, and Rüppell.

33. **Pomacentrus moluccensis.**

Bleek. Amboina, iii. p. 118.

D. $\frac{13}{13-14}$. A. $\frac{2}{13-14}$. L. lat. 26. L. transv. 3/9.

The height of the body is contained twice and two-thirds in the total length; præorbital much longer than broad, with a deep notch anteriorly and with two spinous teeth posteriorly; caudal fin emarginate, with the lobes rounded. Yellow or brownish-yellow, most of the scales with a bluish transverse streak; a small blue spot at the origin of the lateral line and a black one superiorly on the base of the pectoral fin; a bluish streak from the belly across the anal spines to the posterior angle of the anal.

East Indian Archipelago.

a. Thirty-two lines long. From Dr. P. v. Bleeker's Collection.

34. **Pomacentrus interorbitalis.**

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 28. L. transv. $2\frac{1}{2}$ 9.

The height of the body is contained twice and four-fifths in the total length; præorbital not serrated, half as wide as the orbit; snout rather shorter than the eye, the diameter of which equals the width of the interorbital space. The nine posterior dorsal spines are equal in length, half as long as the head. Caudal fin emarginate, with the lobes rounded. Brownish (in spirits); a bluish line across the forehead, another curved round the lower half of the orbit; cheeks and base of the anal with bluish dots; fins immaculate, pectoral, dorsal and caudal light-coloured, ventrals and anal blackish; no axillary spot.

East Indian Archipelago.

a. Two inches long.—The British Museum has received this specimen from Dr. v. Bleeker's Collection as *P. tæniops*, from which it differs in the number of the fin-rays, in the structure of the præorbital, and in the coloration.

35. **Pomacentrus leucostictus.**

Pomacentrus leucostictus, *Müll. & Trosch. in Schomburgk's Barbad.* p. 674.

D. $\frac{12}{15-16}$. A. $\frac{2}{13-14}$. L. lat. 28. L. transv. 3/9. Cæc. pylor. 3.

The height of the body is contained twice and three-fourths in the total length; interorbital space slightly convex; the upper profile of the head arched; only the posterior part of the infraorbital ring is minutely denticulated. The lower præopercular limb scaly. The upper and lower teeth nearly equally broad. Caudal fin forked, with the lobes rather pointed. No spot on the back of the tail; a white dot on the base of the last anal rays. Either nearly uniform brown, with scarcely any dots on the snout and the base of the dorsal and anal fins, or brownish-black above, yellowish-green on the sides and on the belly, and yellow on the posterior part of the tail and on the caudal fin; numerous bluish-white dots on the head, back, and on the soft portions of the dorsal and anal fins, the dots being less numerous on the sides.

Atlantic coasts of tropical America.

a, b–c. Fine specimens. Puerto Cabello. Purchased of Mr. Brandt.
d–e. Young. Jamaica. From Mr. Gosse's Collection.
f–g. Adult. America. From Dr. Parnell's Collection.

Young specimens have a distinct black ocellus on the middle of the anterior soft dorsal rays; blue dots are crowded round it, forming a blue ring. Snout with two short, convergent blue lines superiorly.

36. **Pomacentrus fuscus.**

Pomacentrus fuscus, *Cuv. & Val.* v. p. 432.
—— variabilis *Casteln. Anim. nouv. ou rares, Poiss.* p. 9. pl. 3. fig. 3.
—— nigricans, pt., *Gronov. Syst. ed. Gray*, p. 61.

D. $\frac{12}{13-14}$. A. $\frac{2}{13}$. L. lat. 28. L. transv. 3/10.

The height of the body is contained twice and three-fifths in the total length; interorbital space convex; the upper profile of the head arched; only the middle and hinder parts of the infraorbital ring are finely denticulated; the lower præopercular limb scaly. Caudal fin emarginate, with the lobes obtusely rounded, the upper being the longer. Nearly uniform brownish, with a yellowish shade; only a few indistinct bluish dots on the side of the snout and above the anal fin; vertical fins deep-black; a rather indistinct blackish blotch on the back of the tail; axil of the pectoral blackish superiorly.

Bahia.

a–b. Fine specimens (3½ to 4⅓ inches long). Bahia. From Dr. O. Wucherer's Collection.

37. Pomacentrus otophorus.

Poey, Memor. Cub. ii. p. 188.

D. $\frac{12}{14}$. A. $\frac{2}{12}$. L. lat. 27. Cæc. pylor. 3. Vert. 11/15.

The height of the body is contained twice and two-thirds in the total length; the maxillary does not extend to the orbit; only the posterior infraorbitals are denticulated; caudal fin forked, the other vertical fins produced into a point. Brown: fins blackish, with their points yellow; base of the pectoral black; a black spot superiorly on the operculum. (*Poey.*)

Cuba.

38. Pomacentrus xanthurus.

Poey, l. c. p. 190.

D. $\frac{12}{14}$. A. $\frac{2}{12}$.

The height of the body is contained twice and two-thirds in the total length; the maxillary extends to the vertical from the orbit; denticulation of the infraorbital very feeble. Brown: pectoral, ventral, caudal, and the point of the dorsal orange-coloured. (*Poey.*)

Cuba.

39. Pomacentrus littoralis.

Pomacentrus littoralis, (*Kuhl & v. Hass.*) *Cuv. & Val.* v. p. 425; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 20. tab. 4. fig. 3; *Bleek. Batav.* p. 483
—— pristiger, *Cuv. & Val.* ix. p. 506.
—— hogoleuensis, *Hombr. & Jacqu. Voy. Pôle Sud, Poiss.* p. 47. pl. 5. fig. 3.
? Pristotis fuscus, *Bleek. Verhand. Batav. Genootsch.* xxii. *Bali*, p. 9.

D. $\frac{12-13}{15-13}$. A. $\frac{2}{14-15}$. L. lat. 26–27. L. transv. 3/9. Vert. 11/15.

The height of the body is contained twice and four-fifths or twice and three-fourths in the total length; præorbital strongly denticulated, with one or two stronger teeth anteriorly. The dorsal spines increase in length towards behind; caudal emarginate, with the lobes rounded. Brown, either uniform or with some darker spots, namely one at the base of the pectoral fin, one at the commencement of the lateral line, and one on the back of the tail behind the dorsal fin.

Ile de France. East Indian Archipelago. Polynesia. Coasts of Australia.

a. Adult. East Indies. From the Collection of the East India Company.
b–d, *e*, *f*, *g*. Fine specimens. Amboyna. Purchased of Mr. Frank.
h. Adult. Dove's Island. Presented by J. B. Jukes, Esq.
i. Adult. Port Essington. From the Haslar Collection.
k. Adult. Australia. From Mr. Macgillivray's Collection.
l. Adult: skeleton. Amboyna. Purchased of Mr. Frank.

Pomacentrus katunko (Bleek. Timor, p. 169) is very closely allied to, if not identical with, this species.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

40. **Pomacentrus tripunctatus.**

Cuv. & Val. v. p. 421.

D. $\frac{13}{15}$. A. $\frac{2}{14}$.

Præorbital not serrated (? in immature specimens). Caudal fin forked, with the lobes pointed. Dark-brown, with a small black spot above the operculum, another on the soft dorsal fin, and a third, which is edged with white anteriorly, on the back of the tail, immediately behind the dorsal fin. (*Cuv.*)

Sea of Vanicolo.

Known from specimens 1½ to 2 inches long; perhaps the immature state of a known species.

41. **Pomacentrus vanicolensis.**

Cuv. & Val. v. p. 421.

D. $\frac{13}{14}$. A. $\frac{2}{14}$.

Præorbital denticulated, much longer than broad; caudal fin emarginate. Brown, with a black spot, edged with white anteriorly, on the back of the tail; operculum with a dark spot superiorly. Immature specimens with a dark spot on the soft dorsal fin. (*Cuv.*)

Vanicolo.

42. **Pomacentrus planifrons.**

Cuv. & Val. v. p. 431.

D. $\frac{12}{15}$. A. $\frac{2}{14}$. L. lat. 29. L. transv. 3/10.

The height of the body is contained twice and a third in the total length; interorbital space flat, anterior profile of the head straight; only the posterior half of the infraorbital ring is finely denticulated. The dorsal spines increase in length towards behind; caudal forked.

Brown: a black spot superiorly in the axil of the pectoral, and a blackish spot on the back of the tail.

Caribbean Sea.

a–e. Adult: skins. Jamaica. From Dr. Parnell's Collection.

43. Pomacentrus nigricans.

Holocentrus nigricans, *Lacép.* iv. pp. 332, 367.
Pomacentrus nigricans, *Cuv. & Val.* v. p. 425; *Quoy & Gaim. Voy. Uran. Zool.* p. 399.

D. $\frac{13}{16}$. A. $\frac{2}{13}$.

The height of the body is one-half of the total length; the upper profile of the head is nearly straight; the infraorbital is narrow and very finely serrated posteriorly; præoperculum rather indistinctly denticulated; operculum with two small spines. Uniform blackish-brown.

Sandwich Islands.

44. Pomacentrus latifrons.

Tschudi, Faun. Per. Pisc. p. 17.

D. $\frac{13}{20}$. A. $\frac{2}{14}$.

The height of the body is somewhat more than one-third of the total length. The middle dorsal spines are longer than the posterior ones. Caudal emarginate. Uniform grey. (*Tsch.*)

Coast of Peru.

We are not certain whether this species really belongs to *Pomacentrus*. Tschudi does not say anything about the denticulations of the præorbital and præoperculum; the vertical fins are scaly. We are not aware whether, or where, the typical specimens, which were nine inches long, are preserved.

6. GLYPHIDODON*.

Glyphisodon, pt., *Lacép.* iv. p. 542.
Glyphisodon, *Cuv. Règne Anim.*
Euschistodus, Hypsypops, sp., et Glyphidodon, *Gill in Proc. Ac. Nat. Sc. Philad.* 1862, pp. 145, 147

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* 1. Glyphisodon abdominalis, *Quoy & Gaim. Voy. Uran. Zool.* p. 390; *Cuv. & Val.* v. p. 457.—Sandwich Islands.
2. Bodianus macrolepidotus, *Bl.* t. 230; *Bl. Schn.* p. 331; *Lacép.* iv. p. 286. —Glyphisodon macrolepidotus, *Cuv. & Val.* v. p. 473.—East Indies.
3. —— margariteus, *Cuv. & Val.* v. p. 470. Ile de France.
4. —— glaucus, *Cuv. & Val.* v. p. 475.—Guam.
5. —— dickii, *Liénard, Dix. Rapp. Soc. Hist. Nat. Maurit.* p. 35.—The publication containing the short description of this species not being easily accessible, we copy the note of M. Liénard: "Elle a été trouvée dans l'estomac d'un Mérou pêché par 40 brasses de profondeur Sa forme est tres raccourcie, sa dorsale et son anale sont tres élevées et finissent en pointe. Son profil n'est pas arqué comme celui de presque tous

Præoperculum not denticulated. Teeth compressed, in a single series; the series sometimes composed of alternate teeth. Dorsal fin with twelve or thirteen spines, anal with two (three in *G. nigros*). Scales of moderate size, in 30 or less transverse series; the lateral line ceases below the posterior portion of the dorsal fin. Branchiostegals five or six; gills three and a half; pseudobranchiæ present; an air-bladder. Pyloric appendages three.

Tropical seas of both hemispheres. Single species extend northwards to the latitude of Madeira in the Atlantic and of California in the Pacific, southwards to the latitudes of New Zealand and of South Australia.

Synopsis of the Species.

- I. Teeth fixed: *Glyphidodon.*
  - A. Body with several transverse bands.
    - 1. Cross-bands darker than the ground-colour, p. 35.
    - 2. Cross-bands lighter than the ground-colour, p. 43.
  - B. Body more or less uniform, or bicoloured, or with small ornamental markings.
    - 1. The height of the body is one-half, or more than one-half, of the total length (the caudal fin not included), p. 44.
    - 2. The height of the body is less than one-half of the total length (the caudal fin not included), p. 50.
- II. Teeth in the upper jaw moveable: *Microspathodon*, p. 57.
- (III. Three anal spines, p. 57.)

I. Teeth fixed.

A. Body with several transverse bands.

1. Cross-bands darker than the ground-colour.

1. **Glyphidodon saxatilis.**

The Jaqueta. La Demoiselle.
Marcgr. p. 156; *Pison. Ind.* p. 68.
Chætodon saxatilis, *L. Syst. Nat.* i. p. 466; *Bl.* iii. p. 96, part. (the figure appeaıs to be taken from an Indian specimen).
—— marginatus, *Bl.* iii. p. 98 (tab. 207 incorrect); *Lacép.* iv. pp. 451, 463.
—— mauritii, *Bl.* iii. p. 109. taf. 213. fig. 1; *Bl. Schn.* p. 234; *Lacép.* iv. pp. 452, 470.

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les Glyphisodons. Toutes les écailles sont vermiculées et le bord de chacune richement guilloché. La prunelle grande et noire est entourée d'un petit cercle jaune. Une teinte légère de violet couvre la tête. Le ventre est violet bleuâtre, le dos grisâtre; la dorsale, l'anale et la ventrale sont noires; la pectorale grise, la queue et la caudale aurores. Une bande verticale qui embrasse la largeur de trois écailles est placée un peu avant la queue. L'individu a 3½ pouces de long."—Mauritius.

Chætodon sargoides, *Lacép.* iv. pp. 453, 471, 472.
Glyphisodon saxatilis, *Cuv. & Val.* v. p. 446.

D. $\frac{13}{13}$. A. $\frac{2}{12}$. L. lat. 30. L. transv. 4/11. Cæc. pylor. 3. Vert. 12/14.

The height of the body is contained once and three-fourths (twice in young specimens) *in the total length* (the caudal fin not included); the width of the interorbital space equals that of the orbit; the breadth of the infraorbital ring below the centre of the eye is one-half of the greatest breadth of the præorbital. Incisors rather narrow, notched. The soft dorsal is produced into a point, the fourth and fifth rays being the longest; caudal fin forked. Body with five black cross-bands, which are not broader than the interspaces between them: the first from the first dorsal spine to the humerus; the second from the fourth and fifth dorsal spines towards the middle of the ventral fin; the third from the ninth and tenth dorsal spines towards the vent; the fourth from the end of the spinous dorsal to the middle of the anal; the fifth immediately below the end of the soft dorsal, and continued on the posterior rays.

Tropical parts of the Atlantic.

a–c. Young. Island of Cordova. Presented by J. U. Skinner, Esq.
d, e. Fine specimens. Puerto Cabello. Purchased of Mr. Brandt.
f. Fine specimen. S. Domingo. Purchased of Mr. Cuming.
g–h, i. Adult and half-grown. Caribbean Sea.
k–x. Skins. Caribbean Sea. From Dr. Parnell's Collection.
y–z. Adult: bad state. Bahia. Purchased of M. Parzudaki.
α, β, γ, δ, ε–ζ. Adult and half-grown.
η. Half-grown: stuffed.
θ. Adult: skeleton. Caribbean Sea.

2. **Glyphidodon troschelii.**

Gill in Proc. Acad. Nat. Sc. Philad. 1862, p. 150.

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 29–30. L. transv. 4/11.

The height of the body is one-half of the total length (without caudal); the width of the interorbital space equals that of the orbit; the breadth of the infraorbital ring below the centre of the eye is rather less than one-half of the greatest breadth of the præorbital. Incisors narrow, notched. The soft dorsal is slightly produced into a point formed by the third, fourth and fifth rays, which are the longest; caudal forked. Body with five blackish cross-bands, which are not broader than the interspaces between them: the first below or immediately before the origin of the dorsal fin; the second below the third and fifth spines; the third from the seventh and ninth dorsal spines to the vent; the fourth below and immediately before the origin of the soft dorsal; the fifth immediately behind the end of the dorsal and anal fins.

Coast of Lower California.

a–c. Young. Cape St. Lucas. Presented by the Smithsonian Institution.

This species is extremely similar to *G. saxatilis*, but appears to have the body more elongate, and the last cross-band does not extend over the posterior dorsal rays.

3. Glyphidodon rudis.

Poey, Mem. Cub. ii. p. 191.

D. $\frac{13}{12}$. A. $\frac{2}{10}$. L. lat. 25. Cæc. pylor. 3.

Teeth deeply notched; [præoperculum with coarse denticulations ?]. The height of the body is contained twice and a quarter in the total length; caudal fin emarginate. Brown, with five broad vertical bands. (*Poey.*)

Cuba.

4. Glyphidodon taurus.

The Dove-tail Fish.
Müll. & Trosch. in Schomb. Barbad. p. 674.

D. $\frac{12}{12}$. A. $\frac{2}{10}$.

Teeth notched; the cleft of the mouth does not extend to the vertical from the orbit; the præorbital, above the angle of the mouth, is nearly as broad as the diameter of the eye. The five vertical bands are less distinct than in *G. saxatilis*. (*M. & T.*)

Barbadoes.

5. Glyphidodon concolor.

Euschistodus concolor, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 145.

D. $\frac{13}{12}$. A. $\frac{2}{10}$. L. lat. 27. L. transv. $3\frac{1}{2}/10$.

The height of the body is somewhat more than one-half of the total length (without caudal); the width of the interorbital space, which is slightly convex, is more than that of the orbit. The breadth of the infraorbital ring below the middle of the eye is two-thirds of the greatest breadth of the præorbital. (Præopercular margins not serrated.) Incisors moderately broad, deeply notched. Caudal fin slightly emarginate. Body dark-greenish-olive, with five rather indistinct blackish cross-bands: the first very obscure, in front of the dorsal fin; the second from the third to fifth spines; the third from the seventh to ninth towards the vent; the fourth from the last dorsal spines towards the anterior soft anal rays; the fifth from below the posterior half of the soft dorsal; pectoral with a tapering black transverse line at the base.

Atlantic and Pacific coasts of Central America.

a. Four inches long. Panama. Presented by the Smithsonian Institution.

b–e. Adult, half-grown, and young. Panama. Collected by Captain Dow; presented by Dr. P. L. Sclater, Secr. Zool. Soc.

f, g. Many young and half-grown specimens. Island of Cordova. Presented by J. U. Skinner, Esq.

6. Glyphidodon declivifrons.

Euschistodus declivifrons, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 146.

D. $\frac{13}{13}$. A. $\frac{2}{10}$*. L. lat. 28. L. transv. 3½/9.

The height of the body is a little more than one-half of the total length (without caudal); the width of the interorbital space, which is very convex, equals that of the orbit; the breadth of the infraorbital ring below the centre of the eye is rather less than one-half of the greatest breadth of the præorbital. Incisors moderately broad, deeply notched. Body light-greenish, shining golden, with six blackish cross-bands, which are as broad as the interspaces between them: the first is indistinct and immediately before the origin of the dorsal; the second below the third to fifth spines; the third below the sixth to eighth; the fourth from the eleventh and thirteenth to the anal spines; the fifth from the middle of the soft dorsal towards the end of the anal; the sixth across the middle of the free portion of the tail.

Coasts of Lower California and Nicaragua.

a. Two and a half inches long. Cape St. Lucas. Presented by the Smithsonian Institution.

b. Many young specimens (from 1 to 2 inches long). Island of Cordova. Presented by J. U. Skinner, Esq.

7. Glyphidodon cœlestinus.

Renard, i. pl. 33. no. 176; *Valent.* no. 75.
Sparus, sp., *Groñov. Zoophyl.* no. 222.
Chætodon saxatilis, *Forsk.* p. 62; *Bl.* tab. 206. fig. 2.
Labrus sexfasciatus, *Lacép.* iii. p. 477. pl. 19. fig. 2.
Rahti potah, *Russell*, i. p. 67. pl. 86.
Chætodon tyrwhitti, *Benn. Fish. of Ceylon*, pl. 25.
Glyphisodon saxatilis, *Rüpp. Atl. Fische*, p. 35, and *N. W. Fische*, p. 126.
—— rahti, *Cuv. & Val.* v. p. 456, ix. p. 507; *Cant. Mal. Fish.* p. 242; *Schleg. Overz. Amphipr. &c. in Verh. Ned. Overz. Bezitt.* p. 22; *Bleek. Amb. & Cer.* p. 287; *Richards. Ichth. Chin.* p. 253.
—— cœlestinus, (*Soland.*) *Cuv. & Val.* v. p. 464, ix. p. 508; *Richards. l. c.*; *Bleek. in Verhand. Batav. Genootsch.* xxi. *Labr. Cten.* p. 15; *Guér.-Ménev. Iconogr.* iii. pl. 19. fig. 8.
—— tyrwhitti, *Richards. l. c.*
—— quadrifasciatus, *Bleek. Labr. Cten.* p. 17.
—— waigiensis, *Bleek. Labr. Cten.* p. 13, and *Batav.* p. 484.
Sparus fasciatus, *Gronov. Syst. ed. Gray*, p. 60.

D. $\frac{13}{13}$. A. $\frac{2}{12-14}$. L. lat. 29–30. L. transv. 4/11. Vert. 11/15.

The height of the body is one-half or somewhat more than one-half of the total length (the caudal fin not included). The width of the interorbital space equals that of the orbit (in immature specimens), or is rather more in adult ones; the breadth of the infraorbital ring below the centre of the eye is one-third of the greatest breadth of the præorbital. The soft dorsal fin is produced into a point, the fourth and fifth rays being the longest; caudal fin forked. Body with five blackish cross-bands, which are not broader than the interspaces between them: the first from before the origin of the spinous dorsal to the base of the pectoral fin; the second from the fourth, fifth and sixth dorsal spines towards the middle of the ventral fin; the third from the tenth, eleventh and twelfth dorsal spines towards the anal spines; the fourth from the middle of the soft dorsal to the middle of the anal; the fifth across the middle of the free portion of the tail.

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* Mr. Gill mentions twelve anal rays, whilst I can find only ten in one of the typical specimens sent by the Smithsonian Institution to the Museum.

From the Red Sea through all the Indian Seas to Polynesia.

Var. *a*. *G. cœlestinus.* The caudal fin has a blackish streak along each lobe.

a. Half-grown. Hong Kong. Presented by Sir J. C. Bowring.
b. Adult. From the Collection of the Zoological Society.
c. Half-grown: skin. From Gronow's Collection.

Var. *β*. *G. rahti.* The caudal fin is uniform transparent, or blackish on the basal portion.

d–i. Half-grown and young: skins. Pinang. From Dr. Cantor's Collection.
k. Young. Pinang. From Dr. Cantor's Collection.
l. Half-grown: skin. China. Presented by J. R. Reeves, Esq.*
m. Young. China. Presented by Vice-Admiral Sir E. Belcher, C.B.
n–p. Fine specimens. Amboyna. Purchased of Mr. Frank.
q. Half-grown. From Dr. P. v. Bleeker's Collection. (*G. waigiensis.*)
r. Half-grown. From Dr. P. v. Bleeker's Collection. (*G. quadrifasciatus.*)
s. Many young specimens. India.
t. Half-grown: bad state. Old Collection.

Whilst I cannot hesitate to consider *G. rahti* and *G. cœlestinus* as individual varieties of one and the same species, *G. waigiensis* may be really different, and distinguished by a more elevated body, the depth of which is three-fifths of the total length (the caudal fin not included); it has been described by Quoy & Gaim. Voy. Uran. Zool. p. 391, and by Cuv. & Val. v. p. 457. The following specimens in the British Museum Collection appear to belong to this species or variety:—

a. Half-grown. Sandwich Islands. From the Berlin Museum.
b. Half-grown: stuffed.

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* It is very probable that this is the specimen mentioned by Sir J. Richardson as *Glyphisodon tyrwhitti* (*l. c.*); its teeth are in a single series as in the other Glyphidodonts; and we suppose that Sir J. Richardson considered the broad-toothed Chinese species (*G. septemfasciatus*) as *G. cœlestinus*, which, in fact, has the teeth as narrow and slender as in *G. saxatilis*.

8. Glyphidodon schlegelii.

Bleeker, Ternate, p. 138.

D. $\frac{13}{10}$. A. $\frac{2}{12}$. L. lat. 26. L. transv. 2/10.

The height of the body is contained once and three-fourths in the total length (without caudal). The snout is much shorter than the eye; the præorbital, above the angle of the mouth, is one-half of the width of the eye. Teeth small, about 56 in the upper jaw. Caudal fin deeply forked. Greenish, with five or six brown cross-bands which are close together, the first across the operculum, the second to the pectoral, the third to the ventral, the fourth and fifth to the anal, the sixth on the tail.

Coasts of Celebes, Ternate, and Goram.

a. From Dr. P. v. Bleeker's Collection.

9. Glyphidodon septemfasciatus.

Cuv. & Val. v. p. 463; *Bleek. Sumatra,* i. p. 582.

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 30. L. transv 3/11. Vert. 12/14.

The height of the body is a little more than one-half of the total length (the caudal fin not included); the interorbital space is as wide as the orbit, and the scales on it do not advance quite as far as the front margin of the eye. The breadth of the infraorbital ring below the centre of the orbit is somewhat more than one-half of the greatest breadth of the præorbital. The upper jaw with eight incisors in front, which are more or less emarginate and broader than the lateral teeth. The soft dorsal is somewhat produced, the third, fourth and fifth rays being the longest. Caudal fin forked. A more or less distinct eyelid covers the upper anterior part of the eye. Body with seven brownish cross-bands, which are broader than the interspaces of the ground-colour between them: the first rather indistinct, from the occiput to the præoperculum; the second from the nape of the neck and from the first dorsal spine to the base of the pectoral, which has a black spot superiorly at the base; the third to sixth from the dorsal fin; the seventh across the tail, immediately behind the dorsal and anal fins.

From Mauritius to the Philippine Islands and to the coasts of China.

a–b, c. Adult. China. Presented by Vice-Admiral Sir E. Belcher, C.B.
d. Philippine Islands. Purchased of Mr. Cuming.
e. Skin. Ceylon. From Dr. Kelaart's Collection.
f. Adult: skeleton. China. Presented by Vice-Admiral Sir E. Belcher, C.B.

Skeleton.—In no other species of this genus and the genera allied to it have I so distinctly observed a certain peculiarity of the mandible as in *Gl. septemfasciatus.* The suture between the dentary and articulary bones is so loose, that the former is quite moveable, as if a joint existed between them.

10. Glyphidodon bengalensis.

? ? Chætodon bengalensis, *Bl.* taf. 213. fig. 2.
Labrus macrogaster, *Lacép.* iii. pp. 430, 477. pl. 19. fig. 3.
Glyphisodon bengalensis, *Cuv. & Val.* v. p. 458; *Bleek. Verhand. Batav. Genootsch.* xxi. *Labr. Cten.* p. 11.

D. $\frac{13}{12}$. A. $\frac{2}{12}$. L. lat. 30. L. transv. 4/11.

The height of the body is contained once and three-fourths in the total length (the caudal fin not included); the width of the interorbital space is more than that of the orbit; the breadth of the infraorbital ring below the centre of the eye is one-half of the greatest breadth of the præorbital. The soft dorsal fin is produced into a point, the third, fourth and fifth rays being the longest; caudal fin forked. Body with seven blackish cross-bands: the first is indistinct, and descends obliquely from the nape to the orbit and præoperculum; the second from the first and second dorsal spines to the axil of the pectoral; the third from the fifth dorsal spine towards the middle of the ventral; the fourth from the eighth and ninth dorsal spines towards the vent; the fifth from the two last dorsal spines to the second of the anal fin; the sixth from behind the middle of the soft dorsal fin towards the end of the anal; the seventh is indistinct, across the tail.

Indian Seas.

a, *b*. Adult and half-grown. Amboyna. Purchased of Mr. Frank.

11. Glyphidodon affinis.

D. $\frac{13}{14}$. A. $\frac{2}{15}$. L. lat. 29. L. transv. 4/11.

The height of the body is rather more than one-half of the total length (the caudal fin not included); head a little higher than long. The width of the interorbital space equals the extent of the snout, and is rather more than the width of the orbit. The scales on the upper surface of the head advance to the front margin of the eye. The breadth of the infraorbital ring below the centre of the eye is one-half of the greatest breadth of the præorbital. Teeth compressed, very narrow, of moderate length. The soft dorsal and anal fins angular; caudal forked, with the lobes rounded. Body with six dark cross-bands, which are narrower than the interspaces between them: the first indistinct, from the nape to the operculum; the second from the two first dorsal spines to the base of the pectoral; the third from the fifth and sixth dorsal spines to behind the base of the ventral; the fourth from the tenth and eleventh dorsal spines to the vent; the fifth from the three anterior dorsal rays to the three anterior anal rays; the sixth across the tail, immediately behind the vertical fins.

Chinese Sea.

a. Six inches long. China.

12. Glyphidodon sordidus.

Chætodon sordidus, *Forsk.* p. 62. no. 87; *Bl. Schn.* p. 230.
Pomacanthus sordidus, *Lacép.* iv. p. 519.

Russell, tab. 85.
Glyphisodon sordidus, *Rüpp. Atl. Fische*, p. 34. taf. 8. fig. 1; *Cuv. & Val.* v. p. 466; *Bleek. Verhand. Batav. Genootsch.* xxi. *Labr. Cten.* p. 16.
—— gigas, *Liénard, Dix. Rapp. Soc. Hist. Nat. Maur.* p. 35.

D. $\frac{13}{14-16}$. A. $\frac{2}{14-15}$. L. lat. 29. L. transv. 4/12. Cæc. pylor. 3. Vert. 12/14.

The height of the body is rather more than one-half of the total length (the caudal fin not included); the width of the interorbital space is more than that of the orbit; the scales advance to the front margin of the eye. The breadth of the infraorbital ring below the centre of the eye is more than one-half of the greatest breadth of the præorbital. Teeth very narrow and slender; vertical fins obtusely rounded; caudal deeply emarginate. Body with about six dark, rather indistinct cross-bands, broader than the interspaces of the ground-colour between them; a large black spot across the back of the tail, immediately behind the dorsal.

Young specimens have the anterior half of the spinous dorsal fin black.

Indian Seas.

a, b. Adult. China.
c, d–e. Adult, half-grown, and young. Mauritius. From the Collection of the Zoological Society.
f. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.
g. Adult: stuffed.
h. Young. From the Haslar Collection.
i. Adult: skeleton. China. From the Haslar Collection.

13. Glyphidodon breviceps.

Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt. p. 23.

D. $\frac{13}{11}$. A. $\frac{2}{12}$.

Body oblong; snout very short; the sixth and seventh rays of the dorsal fin, the ninth and tenth of the anal, the ventrals, and the caudal lobes produced into filaments. Yellowish, with three broad darker cross-bands: the first from the occiput through the eye, the second from the nape and the origin of the dorsal fin, the third from the soft dorsal. Dorsal and caudal fins with numerous light dots disposed in series. (*Schleg.*)

South-west coast of Sumatra.

14. Glyphidodon trifasciatus.

Chætodon curaçao, *Bl.* iii. p. 106. taf. 212. fig. 1; *Bl. Schn.* p. 234; *Lacép.* iv. p. 463.
Glyphisodon curassao, *Cuv. & Val.* v. p. 471.
—— trifasciatus, *Bleek. Labr. Cten.* p. 19.

D. $\frac{13}{12-13}$. A. $\frac{2}{13-14}$. L. lat. 27. L. transv. 3/10. Vert. 12/14.

The height of the body is three-fifths of the total length (the caudal fin not included); the snout is nearly as long as the eye; the præorbital has a distinct notch above the maxillary, and its greatest width is one-half of that of the orbit. Incisors short, small, trenchant. The seventh and eighth dorsal spines are longer than the twelfth, which is generally somewhat shorter than the last; the soft dorsal elevated; the caudal forked. Greenish-olive, with three black cross-bands, which are ill-defined, and formed by black spots on the cutaneous sheaths of the transparent scales: the first from the first five or six dorsal spines to the pectoral, the second from the ninth and twelfth dorsal spines to the vent, and the third between the soft dorsal and anal.

East Indian Archipelago.

a, *b*. Fine specimens. Amboyna. Purchased of Mr. Frank.
c. Adult: skeleton. Ceram. From the Collection of Madame Ida Pfeiffer.

This species does not come from the West Indies, as stated by Bloch, but from different islands of the East Indian Archipelago. The species may be easily recognized from the figure given by Bloch; the name, however, which he has proposed for it must be rejected, as it is derived from a wrong locality.

2. Cross-bands lighter than the ground-colour.

15. Glyphidodon albofasciatus.

Hombr. & Jacq. Voy. Pôle Sud, Poiss. p. 49. pl. 5. fig. 4.

D. $\frac{13}{18}$. A. $\frac{2}{12}$.

The height of the body is two-fifths of the total length (the caudal fin not included); teeth narrow; caudal fin emarginate. Brownish-green, with three white cross-bands: the first descends obliquely from the shoulder behind the pectoral to the base of the ventral; the second also is somewhat oblique and descends from before the middle of the spinous dorsal fin to the vent; the third across the middle of the free portion of the tail: ventral fins whitish, with the exterior margin blackish. Cheeks with some whitish dots. *(H. & J.)*

Island of Poulolant (Borneo group).

16. Glyphidodon xanthozona.

Bleeker, Sumatra, ii. p. 283.

D. $\frac{13}{12\text{–}13}$. A. $\frac{2}{12\text{–}13}$. L. lat. 28. L. transv. 3/8.

The height of the body is contained twice and two-fifths in the total length (the caudal fin not included); the width of the præorbital, above the angle of the mouth, is one-half, or, in immature specimens, less than one-half of that of the orbit; teeth very narrow, with a second series of still narrower ones which are alternate with those of the front series. Caudal fin emarginate. Brownish-violet, with three yellow cross-bands: one across the operculum, one from the fourth, fifth and sixth dorsal spines to the middle of the belly, and one across the tail; fins orange-coloured; the spinous dorsal and the caudal with a brown margin, the soft dorsal with an oblique round black spot at the base of the six last dorsal rays; anal with an oblique blue longitudinal streak.

East Indian Archipelago.

a. Four and a half inches long.
b. Half-grown. From Dr. P. v. Bleeker's Collection.

17. Glyphidodon oxyodon.

Bleeker, Act. Soc. Sc. Indo-Nederl. iii. *Celebes*, x. p. 14.

D. $\frac{13}{12}$. A. $\frac{2}{13}$. L. lat. 28. L. transv. $2\frac{1}{2}/9$.

The teeth of the upper jaw are slender, lanceolate, of unequal size, in a single series; some of those of the lower are lobate. The height of the body is one-half of the total length (the caudal fin not included); the snout is much shorter than the eye; the width of the præorbital, above the angle of the mouth, is less than one-half of that of the orbit. Caudal fin scarcely emarginate, with the lobes obtusely rounded. Blackish-violet, with three white cross-bands descending obliquely forwards: the first from the origin of the spinous dorsal towards the snout; the second from the origin of the soft dorsal; the third from the back of the free portion of the tail; another whitish streak from the chin to the præoperculum; a very broad whitish blotch anteriorly on the sides; a whitish ocellus at the base of the eighth dorsal spine.

Sea of Celebes.

a. Twenty-two lines long: not good state. From Dr. P. v. Bleeker's Collection.

B. Body more or less uniform, or bicoloured, or with small ornamental markings.

1. The height of the body is one-half, or more than one-half, of the total length (the caudal fin not included.)

18. Glyphidodon sparoides.

Sargus annularis, var., *Lacép.* iv. pl. 11. fig. 1; [*Quoy & Gaim. Voy. Uran. Zool.* p. 394: cfr. *Cuv. & Val.* v. p. 469.]

Glyphisodon sparoides, *Cuv. & Val.* v. p. 468; *Peters in Wiegm. Arch.* 1855, p. 266.

D. $\frac{13}{13}$. A. $\frac{2}{12}$. L. lat. 30. L. transv. 4/11.

The height of the body is somewhat more than one-half of the total length (the caudal fin not included); the scales on the upper surface of the head advance to before the orbit, nearly to the extremity of the snout. Teeth small, short, narrow; the greatest width of the præorbital is not quite one-half of that of the orbit. Caudal fin deeply forked. Greenish-olive, with a large black blotch on each side of the tail.

Mauritius. Coast of Mozambique.

a. Adult. Mauritius. Collected by C. Telfair, Esq.

19. Glyphidodon bonang.

Bleeker, Sumatra, i. p. 582.

B. 6. D. $\frac{13}{15-16}$. A. $\frac{2}{13}$. L. lat. 29. L. transv. 4/11.

The height of the body is contained once and four-fifths in the total length (without caudal); infraorbitals scaly; caudal fin slightly emarginate, with the lobes rounded. *Mature* specimens uniform brown, the dorsal, anal and ventral fins being blackish towards the margin; a black spot superiorly at the base of the pectoral fin. *Immature* specimens with lighter dots, and with a large dark ocellus edged with whitish on the base of the posterior portion of the soft dorsal fin.

Coasts of Java and Sumatra.

a. Three inches long, with the dorsal ocellus very distinct. From Dr. P. v. Bleeker's Collection.

20. Glyphidodon sculptus.

Peters in Wiegm. Arch. 1855, p. 266.

B. 6. D. $\frac{13}{14}$. A. $\frac{2}{14}$. L. lat. 25. L. transv. 10–11.

The height of the body is rather more than one-half of the total length (the caudal fin not included)*. Greenish above, silvery beneath. (*Pet.*)

Coast of Mozambique.

21. Glyphidodon melas.

Glyphisodon melas, (*Kuhl & van Hass.*) *Cuv. & Val.* v. p. 472; *Bleek. Verhand. Batav. Genootsch.* xxi. *Labr. Cten.* p. 23; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 23. pl. 5. fig. 2.
—— ater, *Cuv. & Val.* v. p. 473.

D. $\frac{13}{14}$. A. $\frac{2}{13}$. L. lat. 28. L. transv. 3/10.

The height of the body is more than one-half of the total length (the caudal fin not included); the infraorbital ring below the orbit is not much narrower than the præorbital. Teeth very narrow, scarcely compressed. Dorsal spines rather short; caudal fin subtruncated. Uniform black, shining greenish.

Red Sea. East Indian Archipelago. New Hebrides.

a. Fine specimen. Ceram. Purchased of Mr. Stevens.
b. Seven inches long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

22. Glyphidodon aureus.

Glyphisodon aureus, (*Kuhl & van Hass.*) *Cuv. & Val.* v. p. 472; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.*

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* Professor Peters says that the body is elevated as in *G. sordidus*.

p. 22. pl. 5. fig. 1; *Cuv. Règne Anim. Ill. Poiss.* pl. 33. fig. 1; *Bleek. Labr. Cten.* p. 21.

D. $\frac{13}{12}$. A. $\frac{2}{13}$. L. lat. 27. L. transv. 3/10.

The height of the body is three-fifths of the total length (the caudal fin not included); the snout is nearly as long as the eye; the præorbital has a distinct notch above the maxillary, and its greatest width is one-half of that of the orbit. Incisors short, small, not emarginate. The seventh and eighth dorsal spines are not longer than the twelfth, and shorter than the thirteenth; the third dorsal ray produced. Caudal forked. Nearly uniform yellow.

Java, Celebes, and Amboyna.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Fine specimen. From Dr. P. v. Bleeker's Collection.

23. **Glyphidodon leucogaster.**

Bleeker, Labr. Cten. p. 26.

D. $\frac{13}{12}$. A. $\frac{2}{13}$. L. lat. 28. L. transv. 3/10.

Body suborbicular, its height being contained once and two-thirds in the total length (without caudal fin); snout shorter than the eye; the præorbital has a very shallow notch behind the maxillary, and its greatest width is one-half of that of the orbit. Incisors short and very small. The seventh and eighth dorsal spines equal in length to the thirteenth; the third dorsal ray is the longest; caudal fin forked, with the lobes pointed. Brownish, with scattered blue dots; belly and ventral fins bright yellow; the posterior dorsal and anal rays yellow, caudal with a darker superior and inferior margin; a black spot superiorly at the base of the pectoral fin.

Coasts of Java, Amboyna, and Banda.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Fine specimen. From Dr. P. v. Bleeker's Collection.

24. **Glyphidodon orbicularis.**

Hombr. & Jacq. Voy. Pôle Sud, Poiss. p. 52. pl. 5. fig. 6 (teeth and præoperculum incorrect).

D. $\frac{13}{13}$. A. $\frac{2}{13}$.

The height of the body is rather more than one-half of the total length (the caudal fin not included). Teeth narrow, trenchant at the extremity. The posterior dorsal spines are shorter than the middle ones; caudal emarginate; the first ventral ray produced into a long filament. Greenish-silvery, with dark streaks along the series of scales; fins uniform, caudal with the upper and lower margins somewhat darker. (*H. & J.*)

Hab. —— ?

25. Glyphidodon ternatensis.

Bleeker, Ternate, p. 137.

D. $\frac{13}{11}$. A. $\frac{2}{12}$. L. lat. 26.

The height of the body is more than one-half of the total length (the caudal fin not included). Snout shorter than the eye; the præorbital, above the angle of the mouth, is half as wide as the orbit; incisors notched. The middle dorsal spines are the longest; caudal forked, with the lobes pointed; the first ventral ray produced. Uniform greenish-olive, the margin of each scale being darker. (*Bl.*)

Sea of Ternate.

26. Glyphidodon batjanensis.

Bleeker, Batjan, p. 373.

D. $\frac{12}{13}$. A. $\frac{2}{15}$. L. lat. 25.

The height of the body is a little more than one-half of the total length (the caudal fin not included); snout shorter than the eye; the width of the præorbital, above the angle of the mouth, is less than one-half of that of the orbit; the six posterior dorsal spines are nearly equal in length, and higher than the anterior ones; caudal fin emarginate, with the lobes obtusely rounded. Head and anterior part of the trunk violet; sides and posterior parts and the fins yellow; sides of the head dotted with blue; two blue streaks from the eye to the snout; the spinous dorsal violet; a brownish spot at the base of the pectoral. (*Bl.*)

Coasts of Batjan and Booroo.

a. Fifteen lines long: not good state. From Dr. P. v. Bleeker's Collection.

27. Glyphidodon nivosus.

Hombr. & Jacq. Voy. Pôle Sud, Poiss. p. 50. pl. 5. fig. 5.

D. $\frac{12}{16}$. A. $\frac{2}{14}$.

The height of the body is one-half of the total length (the caudal fin not included); caudal fin emarginate. Head and trunk brownish-violet; back and spinous dorsal dotted with white. Tail and posterior part of the vertical fins green, the former with scattered black spots.

Hab. —— ?

The description of this species has been taken from a figure; it appears to be nearly allied to *G. batjanensis*, Bleek.

28. Glyphidodon xanthurus.

Bleeker, Amboina, iv. p. 345.

D. $\frac{13}{15}$. A. $\frac{2}{13}$. L. lat. 28.

The height of the body is more than one-half of the total length (the caudal fin not included); snout as long as the eye; the præorbital, above the angle of the mouth, is half as wide as the orbit; the posterior dorsal spines are the longest; caudal fin emarginate. Violet*, orange-coloured posteriorly; a curved brown band between the orbits, the convexity of which is above the extremity of the snout; an indistinct brown band through the eye; another on the operculum, along the præopercular margin. The soft dorsal, the caudal, and a portion of the anal fin orange-coloured; a brown spot superiorly at the base of the pectoral; ventrals black.

Coasts of Flores, Sangi, Amboyna, and Ceram.

a. Fine specimen. Ceram. Purchased of Mr. Stevens.
b. Adult: not good state. From Dr. P. v. Bleeker's Collection.

29. **Glyphidodon melanopus.**

Bleeker, Natuurk. Tydschr. Nederl. Ind. xi. 1856, p. 82.

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 28.

The upper profile of the head is convex; snout shorter than the eye; the width of the præorbital, above the angle of the mouth, is less than one-half of that of the orbit. Each jaw with about 40 teeth. Yellow: most of the scales with a blue spot; the anterior portion of the ventral and anal fins black. (*Bl.*)

Sea of Ora Malang (south-eastern coast of Java).

a. Eighteen lines long: bad state. From Dr. P. v. Bleeker's Collection.

30. **Glyphidodon xanthonotus.**

Bleeker, Natuurk. Tydschr. Nederl. Ind. xviii. p. 357.

D. $\frac{13}{14}$. A. $\frac{2}{13}$. L. lat. 28.

The height of the body is one-half of the total length (the caudal fin not included). The snout is much shorter than the eye; the width of the præorbital, above the angle of the mouth, is one-half of that of the eye. The upper jaw with about 60 teeth. Caudal fin slightly emarginate. Violet: neck, back, and dorsal fin yellow; caudal with a bright-yellow superior and inferior margin; anal blackish-violet; ventrals black, whitish posteriorly. (*Bl.*)

Sea of Bawean.

Very nearly allied to *G. melanopus*.

31. **Glyphidodon behnii.**

Bleeker, Labr. Cten. p. 25.

D. $\frac{13}{13}$. A. $\frac{2}{14}$. L. lat. 26. L. transv. 3/9.

The height of the body is exactly one-half of the total length (without caudal); snout as long as the eye; the infraorbital ring below the eye is not much narrower than the præorbital, which has a shallow notch. Teeth rather narrow. The dorsal spines increase in length posteriorly, the length of the ninth being one-half of that of the head. Caudal fin forked, with the upper lobe longest. Chestnut-brown (in spirits), lighter on the head and shoulders; a deep-brown spot superiorly in the axil of the pectoral.

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* Bleeker mentions blue dots on the body in *Natuurk. Tydschr. Nederl. Ind.* vii. p. 373

Java.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

32. Glyphidodon leucozona.

Bleeker, Naturk. Tydschr. Nederl. Ind. xix. p. 338.

D. $\frac{12}{15}$. A. $\frac{2}{13}$. L. lat. 29. L. transv. 3/10.

The height of the body is one-half of the total length (the caudal fin not included); the snout is shorter than the orbit; the width of the præorbital, above the angle of the mouth, is two-thirds of that of the orbit. Each jaw with about 40 teeth. Caudal fin emarginate, with the lobes rounded; the spinous dorsal scaly. Brown, with blue spots on the side of the head and belly. A light band crosses the body below the sixth and seventh dorsal spines. A blackish spot superiorly in the axil of the pectoral and behind the last dorsal rays; vertical fins blackish.

Java.

a, *b*. Three and a half and three inches long. From Dr. P. v. Bleeker's Collection.

33. Glyphidodon lacrymatus.

Quoy & Gaim. Voy. Uran. Zool. p. 388. pl. 62. fig. 7; *Cuv. & Val.* v. p. 478; *Bleek. Ternate*, v. p. 303.

D. $\frac{12}{15}$ ($\frac{12}{13}$, *C. & V.*). A. $\frac{2}{13}$. L. lat. 27.

The height of the body is one-half of the total length (without caudal); the snout is shorter than the orbit; the width of the præorbital, above the angle of the mouth, is one-half of that of the orbit. Each jaw with about 40 teeth. Caudal fin emarginate, with the lobes rounded; the spinous dorsal scaly. Brown, with small, scattered blue spots; the outer portion of the soft dorsal and anal orange-coloured; caudal and the posterior portion of the tail brownish-yellow; pectoral with a blackish spot across the base. (*Bl.*)

Coasts of Java, Sangi, Ternate, and Guam.

34. Glyphidodon florulentus.

D. $\frac{12}{18}$. A. $\frac{2}{15}$. L. lat. 25. L. transv. 3/9.

The height of the body is rather more than one-half of the total length (the caudal fin not included); the profile between the origin of the dorsal fin and the snout is very slightly bent, obliquely descending. Snout shorter than the eye; the greatest width of the præorbital is less than one-half of that of the orbit. The spinous dorsal scaly. Reddish-olive, with scattered bluish-white ocelli edged with darker; a large black blotch on the hind part of the spinous dorsal fin; the soft dorsal and the anal greyish; caudal yellow; ventral black.

Indian Ocean.

a. Fifteen lines long. Indian Ocean.

35. Glyphidodon dorsalis.

Hypsypops dorsalis, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 147.

Dorsal spines twelve; dorsal and anal fins densely scaly. The height of the body is one-half of the total length (without caudal); præorbital elevated, nearly as high as the orbit. Teeth truncated, not notched. Caudal forked, with the lobes pointed. Twenty-six transverse series of scales. Deep purplish-brown, with a blue spot below the fourth spine, and with another below the third and fourth rays; a third above the first scale of the lateral line; a transverse linear spot behind the dorsal. A blue line extends from the snout to the front of the orbit; another blue line on the præorbital; sides of the head with some blue dots. (*Gill.*)

Lower California.

2. The height of the body is less than one-half of the total length (the caudal fin not included).

36. Glyphidodon antjerius.

Glyphisodon antjerius, *Bleek. Kokos*, iv. p. 454.
—— antjerius, (*Kuhl & v. Hass.*) *Cuv. & Val.* v. p. 481.
—— biocellatus, *Cuv. & Val.* v. p. 482; *Quoy & Gaim. Voy. Uran. Zool.* p. 389; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 24. tab. 6. fig. 4; *Bleek. Sum.* ii. p. 286; *Less. Voy. Coqu. Zool. Poiss.* p. 188.
—— zonatus, *Cuv. & Val.* v. p. 483; *Schleg. l. c.*; *Peters in Wiegm. Arch.* 1855, p. 266.
——.punctulatus, *Cuv. & Val.* v. p. 484.
—— andjerinus, *Schleg. l. c.* p. 24. pl. 6. fig. 3.
—— rossii, *Bleek. Kokos*, p. 48.

D. $\frac{13}{13}$. A. $\frac{2}{12\text{–}14}$. L. lat. 26–28.

The height of the body is contained twice and a quarter to twice and a half in the total length (without caudal). The snout is shorter than the eye; the width of the præorbital, above the angle of the mouth, is one-half of that of the orbit. Teeth narrow, with a second series of still narrower ones which are alternate with those of the front series. The dorsal spines increase in length towards behind; caudal fin emarginate, with the lobes rounded. Ground-colour brownish, or brown, or greenish, or violet-olive, with the ornamental markings variously disposed: a blue streak along the median line of the nape and of the forehead, a second along the base of the dorsal fin proceeding above the eye to the snout, a third through the eye to the maxillary, a fourth below the eye; body with more or less numerous blue spots; two black ocelli edged with blue on the dorsal fin, the anterior on the base of the posterior spines, the posterior smaller and on the base of the posterior rays. Some specimens with a large bluish transverse spot on the body, below the fourth and sixth dorsal spines.

Either or several of these characters may be absent:—

Var. α. The posterior dorsal ocellus is absent: *G. antjerius.*

Var. β. The blue spots on the body are scattered and not numerous; two dorsal ocelli; no transverse spot on the body: *G. biocellatus.*

Var. γ. The blue spots on the body are numerous; two dorsal ocelli; no blue lines along the forehead: *G. punctulatus.*

Var. δ. Body with a bluish transverse spot: *G. fasciatus.*

Var. ε. Nearly all the markings disappear sometimes in large specimens: *G. rossii.*

From the eastern coasts of Africa through the Indian Archipelago to Polynesia.

Var. β.

a. Half-grown.

Var. δ.

b, c. Half-grown. Amboyna. Purchased of Mr. Frank.

d. Adult. Borneo.

37. **Glyphidodon plagiometopon.**

Bleeker, Singapore, p. 67.

D. $\frac{13}{14-15}$. A. $\frac{2}{14-15}$. L. lat. 26–28. L. transv. 3/9.

The height of the body is rather less than one-half of the total length (the caudal fin not included); the upper profile of the head is very oblique and very slightly convex; snout longer than the eye; the præorbital, above the angle of the mouth, equals the width of the orbit; teeth truncated. Caudal fin obliquely truncated; the length of the last dorsal spine is three-fifths of that of the head. Brown: head and the base of the soft dorsal and anal fins dotted with blue; each scale on the sides with a blue transverse streak.

Coasts of Singapore and Java.

a. Six and a half inches long. From Dr. P. v. Bleeker's Collection.

38. **Glyphidodon unimaculatus.**

Glyphisodon unimaculatus, *Cuv. & Val.* v. p. 478; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 23. taf. 6. fig. 1; *Bleek. Sumatra,* ii. p. 284.
—— balinensis, *Bleek. Verhand. Batav. Genootsch.* xxii. *Bali,* p. 9.

D. $\frac{13}{13}$. A. $\frac{2}{12}$. L. lat. 26. L. transv. 2/7.

The height of the body is contained twice and a third in the total length (without caudal). Teeth very narrow and slender, with a second series of still narrower ones which are alternate with those of the front series. The width of the præorbital, above the angle of the mouth, is less than one-half of that of the orbit. Caudal fin forked. Green, each scale with a bluish transverse streak; a large oblong black spot on the posterior dorsal rays.

East Indian Archipelago.

a, b. Borneo.

Chætodon brownriggii (Benn. Fish. Ceyl. pl. 8) or *Glyphisodon brownriggii* (Cuv. & Val. v. p. 484), which has been referred to *G. antjerius* by Bleeker, appears rather to belong to this species.

39. **Glyphidodon uniocellatus.**

Quoy & Gaim. Voy. Uran. Zool. p. 393. pl. 64. fig. 4 (bad); *Cuv. & Val.* v. p. 481; ? *Schleg. Overz. Amphipr. &c. in Verh. Nat. Gesch. Nederl. Overz. Bezitt.* p. 23.

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 28. L. transv. 2/9.

The height of the body is two-fifths of the total length (the caudal fin not included); the width of the orbit is more than that of the interorbital space or than the length of the snout; the greatest width of the præorbital is one-third of the diameter of the eye. Teeth very narrow. Caudal subtruncated, with the lobes rounded. Blue, each scale with a yellow spot; a dark band along the middle of the nape and of the forehead; another from the origin of the lateral line through the eye to the snout, where it meets that of the other side. The lower side of the head brownish. The lower half of the dorsal fin dark-violet, the upper transparent, with a black margin along the spinous portion. *A round black spot posteriorly in the axil of the soft dorsal fin, extending on the base of the three last rays.* Caudal, anal and ventral fins yellowish, the anal with four pearl-coloured longitudinal streaks; pectoral light-violet.

Young specimens (1½ inches long) have the spinous dorsal uniform transparent light-violet.

Timor. Vanicolo. Feejee Islands.

a–d. Adult and half-grown. Feejee Islands. Voyage of the 'Herald.'

40. **Glyphidodon assimilis.**

Glyphisodon uniocellatus, *Bleek. Amboina,* iii. p. 119 (not *Quoy & Gaim.*).

D. $\frac{13}{12}$. A. $\frac{2}{12}$. L. lat. 28. L. transv. 2–3/8.

The height of the body is contained twice and a fourth or twice and a half in the total length (the caudal fin not included). The width of the orbit is more than that of the interorbital space or than the length of the snout. The greatest width of the præorbital is nearly one-half of that of the orbit. Teeth very narrow. Caudal slightly rounded. Blue, each scale with a yellow spot; a dark band along the middle of the nape and of the forehead; another from the origin of the lateral line through the eye to the snout, where it meets that of the other side; two other similar but less distinct streaks further below; the lower side of the head brownish (yellow in life); dorsal and anal bluish; *a round black spot occupies, if present, the base of the fifth and of some of the following rays.*

Var. *α*. The black dorsal spot is present, and the caudal fin is blue.

Var. *β*. The black dorsal spot is present, and the caudal fin is yellow.

Var. *γ*. The black dorsal spot is absent and the caudal fin is blue.

Coasts of Batjan, Amboyna, Goram, Borneo, and of the Philippine Islands.

a. Fine specimen. Borneo. Purchased of Mr. Frank. (Var. *β*.)
b. Fine specimen. Philippine Islands. Purchased of Mr. Cuming. (Var. *γ*.)
c–d. Half-grown. Indian Seas. (Var. *β*.)

This species is very distinct from *G. uniocellatus* of Quoy & Gaimard, which has the black dorsal spot "près de la base et de la fin de la dorsale," whilst it is situated more anteriorly in this species. The variety without the black dorsal spot agrees so closely with *G. assimilis*, that it is certainly not specifically distinct from it. I am, however, not as certain whether specimens of this variety have not been described as *G. azureus*, Quoy & Gaim.; yet none of the French naturalists mention the bands on the head, and therefore I have preferred to describe the present species under a separate denomination.

41. **Glyphidodon azureus.**

Quoy & Gaim. Voy. Uran. Zool. p. 392. pl. 64. fig. 3; *Cuv. & Val.* v. p. 479.

D. $\frac{13}{12}$. A. $\frac{2}{12}$.

The height of the body is one-third of the total length (the caudal fin included). Caudal fin rounded. Uniform blue, fins yellowish.

Timor; Friendly Islands.

42. **Glyphidodon dispar.**

D. $\frac{13}{13}$. A. $\frac{2}{12}$. L. lat. 25. L. transv. 2/8.

The height of the body is contained twice and a third in the total length, the length of the head thrice and a half. The diameter of the eye is nearly two-sevenths of the length of the head, somewhat longer than the snout, and equal to the width of the interorbital space, which is convex. The width of the præorbital is one-half of that of the orbit. Præorbital and præopercular limb naked; scales on the cheek in two series. Teeth narrow, not emarginate, about forty in each jaw. The middle and posterior dorsal spines are nearly equal in length; the soft parts of the vertical fins not prolonged, slightly rounded; caudal somewhat emarginate, two-ninths of the total length.

Brownish-olive, each scale with a light vertical streak; sides of the snout with two bluish lines; dorsal fin of the same colour as the back, *with a roundish deep-black spot on the base of the four last rays*; ventral and anal black; *pectoral without axillary spot.*

Var. *α*. The free portion of the tail yellowish, caudal blackish.
a–b. Thirty-three and twenty-three lines long. Amboyna. Purchased of Mr. Frank.

Var. *β*. Tail and caudal bright yellow.
c. Thirty-one lines long. Amboyna. Purchased of Mr. Frank.

43. Glyphidodon anabatoides.

Bleeker, Labr. Cten. p. 28.

D. $\frac{13}{10}$. A. $\frac{2}{10\text{–}11}$. L. lat. 26. L. transv. $\frac{2\frac{1}{2}}{9}$.

The height of the body is two-fifths of the total length (the caudal fin not included). Snout as long as the eye; the width of the præorbital is one-third of that of the orbit; suborbital inconspicuous. Caudal fin deeply forked, with the lobes pointed. Violet, each scale with a blue dot; a blue spot at the origin of the lateral line; dorsal greenish, blackish superiorly, dotted with blue; anal greenish, blackish inferiorly, dotted with yellowish; caudal with a brownish longitudinal band on each lobe; pectoral with a blackish spot superiorly; ventral greenish.

Coast of Java.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

44. Glyphidodon bankieri.

Glyphisodon bankieri, *Richards. Ichth. Chin.* p. 253.
—— nemurus, *Bleeker, Booroo,* ii. p. 73.

D. $\frac{13}{10\text{–}11}$. A. $\frac{2}{10\text{–}11}$. L. lat. 26–28.

The height of the body is two-fifths of the total length (the caudal fin not included); the snout is shorter than the eye; the width of the infraorbital ring below the orbit is less than one-third of that of the orbit; each jaw with about forty teeth, the anterior ones short, distinctly compressed. The middle rays of the dorsal and anal fins form an angular point; caudal deeply forked, with the lobes more or less produced into filaments. Violet: tail and caudal fin orange-coloured; the scales on the head and tail with a blue dot, those on the trunk with a transverse streak; a blue ocellus edged with brown at the origin of the lateral line. Dorsal fin brownish-violet, yellow posteriorly; anal brownish-yellow; pectoral with a large brown spot superiorly at the base.

Coasts of China, Booroo, and Amboyna.

a–b. Types of the species. China. Presented by Sir J. Richardson.
c. From Dr. P. v. Bleeker's Collection.—One of the typical specimens of *G. nemurus.*

45. Glyphidodon fallax.

Peters, Wiegm. Arch. 1855, p. 266.

D. $\frac{13}{11}$. A. $\frac{2}{11}$. L. lat. 28. L. transv. $\frac{2\text{-}3}{9}$.

The height of the body is two-fifths of the total length (the caudal fin not included); the snout is as long as the eye; the width of the infraorbital ring below the orbit is less than one-third of that of the orbit; scales on the cheek of moderate size, in two series. Each jaw with about forty teeth, the anterior ones of moderate length, distinctly compressed; the middle rays of the dorsal and anal fins and the caudal lobes are more or less produced into filaments. Reddish-olive (in spirits): head and base of the soft dorsal and anal dotted with bluish; dorsal and anal blackish; caudal and ventral light-brownish.

Mozambique.

a. Forty-four lines long. Mozambique. From Prof. Peters's Collection.

Prof. Peters says that this species has during life a coloration very similar to that of *Pomacentrus pavo.*

46. Glyphidodon modestus.

Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt. p. 23. tab. 6. fig. 2; *Bleek. Sumatra,* ii. p. 285.

D. $\frac{13}{12}$. A. $\frac{2}{12}$. L. lat. 24. L. transv. 2/8.

The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head thrice and a half. The diameter of the eye is two-sevenths of the length of the head, equal to the extent of the snout and to the width of the interorbital space, which is convex. Infraorbital ring and præopercular limbs naked; the width of the præorbital, above the angle of the mouth, is rather less than one-half of that of the orbit. Scales on the cheek small, in three series. Teeth rather narrow, about forty in each jaw. The posterior dorsal spines somewhat longer than the middle, three-fifths of the length of the head. The soft dorsal and anal and the caudal lobes rounded; caudal scarcely emarginate, its length being rather more than one-fifth of the total. Yellowish-olive on the back, yellowish on the sides; the outer half of the vertical fins greyish, pectoral and ventral white; a very faint brownish dot superiorly on the axil of the pectoral.

East Indies.

a. Forty lines long. Amboyna. Purchased of Mr. Frank.
b. Half-grown. China Seas. Presented by Vice-Admiral Sir E. Belcher, C.B.
c. Half-grown.

I cannot find any other difference between this species and *Glyphidodon phaiosoma* (Bleek. Verhand. Batav. Genootsch. xxii. Bali, p. 9), except that the colour of the latter is a uniform brown.

47. Glyphidodon leucopoma.

Cuv. & Val. v. p. 480; *Less. & Garn. Voy. Duperr. Zool. Poiss.* p. 189.

D. $\frac{13}{12}$. A. $\frac{2}{12}$.

The height of the body is one-third of the total length (the caudal included); caudal fin rounded. Greyish-violet: operculum white, with a small black spot at the angle; a black spot on the middle of the caudal fin. (*Cuv.*)

Coast of Oualan.

48. Glyphidodon amboinensis.

Bleeker, Act. Soc. Sc. Indo-Nederl. ii. *Amboina,* viii. p. 72.

D. $\frac{13}{9}$. A. $\frac{2}{10}$. L. lat. 28.

The height of the body is less than one-half of the total length (the caudal fin not included); snout shorter than the eye; the width of the infraorbital ring below the eye is less than one-third of that of the orbit; each jaw with about forty teeth. Dorsal and anal fins with the middle rays longest; caudal deeply forked, with the lobes much produced. Brownish-violet, the scales on the tail with a blue dot; caudal and the posterior parts of the dorsal and anal yellow, the former with a brown band along each lobe; a brown spot at the base of the pectoral; ventrals brownish-violet. (*Bl.*)

Coast of Amboyna.

49. Glyphidodon luridus.

Chætodon luridus, *Broussonet.*
Glyphisodon luridus, *Cuv. & Val.* v. p. 475, ix. p. 509.
? Stegastes imbricatus, *Jenyns, Voy. Beagle, Fishes,* pp. 63, 165. pl. 9. fig. 2.

D. $\frac{13}{16}$. A. $\frac{2}{14}$. L. lat. 30. L. transv. 4/11. Vert. 12/14.

The height of the body is contained twice and a third in the total length (the caudal fin not included). Teeth very narrow and slender; the sixth and seventh dorsal rays are produced into a point, and sometimes into a filament; the spinous portion of the dorsal fin nearly entirely enveloped in scales. Caudal deeply forked. Brownish-black, each scale of the lower parts with a bluish dot; axil of the pectoral, the ventral and anal spines bluish.

Coast of Madeira.

a. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
b. Fine specimen. Madeira. Presented by J. Y. Johnson Esq.
c. Adult: not good state. Madeira. Presented by H. H. Methuen.
d. Adult. Madeira. Presented by R. B. Webb, Esq.
e. Adult female: skeleton. Madeira. From the Haslar Collection.

It has been asserted by Lowe, and acknowledged to be the case by Jenyns, that *Stegastes imbricatus* is identical with this species, although *Stegastes* has been described as having a denticulated præoperculum and teeth on the vomer.

50. Glyphidodon limbatus.

Cuv. & Val. v. p. 477.

D. $\frac{12}{17}$. A. $\frac{2}{14}$.

The spinous dorsal fin is scaly. Teeth slightly emarginate. Brown: the soft dorsal and anal fins blackish; the spinous dorsal with a broad black margin. (*Cuv.*)

Sea of Bourbon.

II. Teeth in the upper jaw moveable.

51. Glyphidodon chrysurus.

Glyphisodon chrysurus, *Cuv. & Val.* v. p. 476.
Pomacentrus denegatus, *Poey, Mem. Cub.* ii. p. 190.

D. $\frac{12}{15-16}$. A. $\frac{2}{13-14}$. L. lat. 28–29. L. transv. 3/10.

The height of the body is one-half of the total length (the caudal fin not included); the teeth in the upper jaw are very fine and moveable, as in *Salarias*. Præorbital square, or rather wider than long. Caudal fin forked. Brown: dorsal, anal and ventral fins black, caudal yellow; blue dots round the eyes and on the back.

Caribbean Sea.

a–e. Adult: skins. Caribbean Sea. From Dr. Parnell's Collection.

(III. Three anal spines.)

52. Glyphidodon nigros.

Glyphisodon nigroris, *Cuv. & Val.* v. p. 485.

D. $\frac{13}{14}$. A. $\frac{3}{12}$.

Brownish: lips black. (*Cuv.*)

Hab. ——?

This fish, perhaps, does not belong to the present group.

7. PARMA.

Glyphisodon, sp., *Girard.*
Hypsypops*, sp., *Gill.*

Præoperculum not denticulated. Teeth compressed, in a single series. Dorsal fin with twelve or thirteen spines, anal with two. Scales of moderate size, in more than thirty transverse series; the lateral line ceases below the posterior portion of the dorsal fin.

Pacific.

1. Parma microlepis.

D. $\frac{13}{18}$. A. $\frac{2}{16}$. L. lat. 37. L. transv. 4/13.

The height of the body is two-fifths of the total length (the caudal fin not included); teeth very narrow and slender; præorbital much narrower than the orbit. The fourth and fifth dorsal spines are the longest, the posterior being shorter than those in the middle; caudal fin emarginate. Brown, with two blue lines on each side of the back: the upper commences below the spinous dorsal fin and proceeds above the orbit to the snout; the lower from the ocellus above the lateral line to the orbit. A large black ocellus edged with blue on the four posterior dorsal spines; body with scattered blue dots, the dots forming a series or an uninterrupted line below the orbit; anal and ventral fins blackish: a blue spot posteriorly in the axil of the dorsal fin.

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* This genus is founded on characters entirely different from those of *Parma*, and its limits agree so little with those of the latter, that it would cause only confusion if I were to adopt the name.

Coast of New South Wales.

a, b–d. Adult and young. Port Jackson. Presented by Dr. G. Bennett.

This fish has a coloration similar to that of *G. antjerius* or *G. biocellatus*, under which name a figure of Mr. G. F. Angas has been published by Dr. G. Bennett in the 'Proceedings' of the Zoological Society, 1859, Pisc. pl. 9. fig. A. Nevertheless it may be readily distinguished by a more accurate examination, when the scales will be found to be smaller than in the species of *Glyphidodon*, the fin-rays more numerous, &c. The figure quoted is not quite correct: the ocellus is on the back, instead of on the dorsal spines; the eye is rather too small, and the posterior dorsal spines are too long.

2. **Parma rubicunda.**

Glyphisodon rubicundus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1854, p. 148, and *U. S. Pacif. R. R. Exped. Fishes*, p. 161. pl. 24.
Hypsypops rubicundus, *Gill in Proc. Acad. Nat. Sc. Philad.* 1861, p. 165.

D. $\frac{12}{16}$. A. $\frac{2}{15}$. L. transv. ca 20.

The height of the body is more than one-half of the total length (the caudal fin not included); præorbital high; caudal fin deeply emarginate, with the lobes rounded. Scales on the operculum larger than those on the middle of the body. Uniform deep crimson (*Gir.*).

Coast of California.

3. **Parma squamipinnis.**

D. $\frac{12-13}{15-17}$. A. $\frac{2}{15}$. L. lat. 40. L. transv. $\frac{5}{14}$.

The height of the body is one-half of the total length (the caudal fin not included). Snout a little longer than the eye. Teeth narrow, compressed, of moderate length, about fifty in the upper jaw. Præorbital scaly, rhombic, its width, above the angle of the mouth, being two-thirds of that of the orbit. The scales on the upper surface of the head advance nearly to the extremity of the snout; præoperculum covered with small scales, a narrow space round its margins being naked. Scales on the operculum only half the size of those on the middle of the body. The fourth to eighth dorsal spines are the longest (two-fifths of the length of the head), and of moderate strength. The anterior half of the soft dorsal fin is much higher than the spinous, and the posterior part of its upper margin is vertical. Caudal fin deeply forked, with the lobes somewhat pointed, the upper lobe being as long as the head. The second anal spine is as long as, but stronger than, the longest of the dorsal fin. The basal half of the dorsal and nearly the whole of the caudal and anal fins are covered with scales. The ventral extends to the anal. Uniform brownish (in a preserved state), with the fins blackish; posterior margin of the soft dorsal white. The colour during life appears to have been red with golden reflexions.

Australia.

a. Six inches long: stuffed. Australia. Purchased of Mr. Warwick.
b. Six inches long: not good state. From the Haslar Collection.

This species is closely allied to *P. rubicunda,* from the Eastern Pacific; both, however, appear to be different, the Australian specimen having small opercular scales,—although the distance of the localities would not be a reason against their specific identity.

4. **Parma polylepis.**

D. $\frac{13}{18}$. A. $\frac{2}{14}$. L. lat. 40. L. transv. 5/15.

The height of the body is more than one-half of the total length (the caudal fin not included); the profile between the origin of the dorsal fin and the snout is arched, forming nearly a quarter of a circle. Snout elevated, a little longer than the eye; teeth very narrow, compressed, about fifty in the upper jaw. Præorbital naked, subquadrangular, nearly as wide as the eye. The scales on the upper surface of the head do not advance to the front margin of the eye; præoperculum covered with small scales, a narrow space round its margins being naked. Scales on the operculum of about the same size as those on the body. The dorsal spines are of moderate length and strength, increasing in length posteriorly; they are nearly entirely enveloped in scales; the soft dorsal is angular, with the posterior part of its upper margin vertical. The second anal spine is as long as, but stronger than, the longest of the dorsal fin. Anal and caudal fins scaly. Caudal fin forked, with the lobes rounded, the upper lobe being as long as the head. The ventral fin extends to the anal.

Owing to the preservation of the specimen in chloride of zinc, the colours are nearly destroyed. The ground-colour appears to have been greenish, fins and snout blackish; two broad brownish cross-bands are still distinct—the anterior below the fourth to the seventh dorsal spines, the posterior between the soft dorsal and anal fins.

Norfolk Island.

a. Six inches long. From the Haslar Collection.

8. HELIASTES.

Chromis, sp., *Cuv. Règne Anim.*
Heliases, *Cuv. & Val.* v. p. 493.
Furcaria, *Poey, Mem. Cub.* ii. p. 194.

Præoperculum not denticulated. Teeth small, conical, in a narrow band or irregular series. Dorsal fin with twelve to fourteen spines, anal with two. Scales of moderate size; the lateral line ceases below the posterior portion of the dorsal fin. Branchiostegals five; gills three and a half; pseudobranchiæ present; pyloric appendages two.

Tropical seas, extending to the Mediterranean and to the coasts of Japan and Chile.

1. Heliastes chromis.

? Χρομὶς, *Aristot.* iv. c. 8, 9, v. c. 9, viii. c. 19*; *Ælian,* ix. c. 7, x. c. 11.
Chromis, *Rondel.* v. c. 21. p. 152; *Gesner,* pp. 223, 264; *Aldrov.* ii. c. 14. p. 168; *Jonston,* i. tit. 3. c. 1. art. 7. taf. 17. fig. 14; *Willughby,* p. 330; *Ray, Syn.* p. 141.
Sparus, *Artedi, Syn.* p. 62. no. 12, and *Genera,* p. 37. no. 10.
Sparus chromis, *L. Syst. Nat.* i. p. 470; *Lacèp.* iv. p. 146; *Risso, Ichth. Nice,* p. 254.
Chromis chromis, *Cuv. Règne Anim.*
—— castanea, *Risso, Eur. Mérid.* iii. p. 343; *Cuv. Règne Anim. Ill. Poiss.* pl. 90. fig. 1 (half-grown); *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 384. pl. 16. fig. 1.
Heliases limbatus, *Cuv. & Val.* ix. p. 511 (adult).
—— castaneus, *Müll. Berl. Abhandl.* 1844, p. 168.

D. $\frac{14}{10-11}$. A. $\frac{2}{10-11}$. L. lat. 26–28. L. transv. $\frac{2-3}{8}$.

The height of the body is one-half or two-fifths of the total length (the caudal not included). Dorsal spines rather strong; the length of the second anal spine is considerably more than one-half of that of the head; caudal fin forked. Brown, shining golden; snout, chin and thorax shining silvery. The spinous dorsal and the four anterior rays black, the rest whitish. Caudal fin whitish, with a broad upper and lower black margin; anal black, whitish posteriorly.

Immature specimens more uniform brownish, with silvery shining longitudinal bands.

a. Fine specimen: seven inches long. Madeira. Presented by the Rev. R. T. Lowe.
b. Adult. Madeira. From the Haslar Collection.
c. Half-grown. Mediterranean. From the Berlin Museum.
d. Half-grown. Cannes. Presented by Th. Günther, M.D.
e. Half-grown. Coast of Dalmatia.
f–h. Adult and half-grown: bad state. Malta. From the Haslar Collection.
i–k, l, m. Half-grown.

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* The *Chromis* of the ancients appears to be some Sciænoid fish.

2. Heliastes axillaris.

Bennett, Proc. Comm. Zool. Soc. 1831, p. 128.

D. $\frac{14}{14}$. A. $\frac{2}{12}$.

Axil black; caudal and anal fins blackish-blue. (*Benn.*)
Mauritius.

3. Heliastes insolatus.

Cuv. & Val. v. p. 494. pl. 137.

D. $\frac{13}{12}$. A. $\frac{2}{12}$. L. lat. 27. L. transv. 2/9. Cæc. pylor. 2.

The height of the body is one-half of the total length (the caudal fin not included). Caudal fin emarginate, with the lobes rounded; the length of the second anal spine is more than one-half of that of the head. Brownish (in spirits), with metallic reflexions; the scales on the upper side of the head and on the anterior part of the back with a blue dot.

Young specimens with two blue lines along the forehead, convergent on the snout, and with a black spot immediately behind the dorsal fin.

Caribbean Sea.

a. Adult. Caribbean Sea. From the Collection of the Zoological Society.

b–d. Young. Island of Cordova. Presented by J. U. Skinner. Esq.

4. Heliastes crusma.

Cuv. & Val. ix. p. 510; *Jenyns, Zool. Beagle, Fishes,* p. 54; *Gay, Hist. Chil. Zool.* ii. p. 206. lam. 4. fig. 1; *Cuv. Règne Anim. Ill. Poiss.* pl. 33. fig. 2.

D. $\frac{12-13}{12}$. A. $\frac{2}{11-12}$. L. lat. 27–29. L. transv. 3/11.

The height of the body is one-half of the total length (the caudal fin not included). Caudal fin forked, with the lobes pointed. Brownish-olive.

Coasts of Chile.

a–b. Eight to nine inches long: have been in chloride of zinc. Chile. From Mr. Bridges' Collection.

5. Heliastes cinerascens.

Cuv. & Val. v. p. 495; *Schleg. Overz. Amphipr. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 24. pl. 6. fig. 5; *Bleek. Labr. Cten.* p. 31.

D. $\frac{13}{11}$. A. $\frac{2}{11}$. L. lat. 24. L. transv. $\frac{2-3}{8}$.

The height of the body is four-ninths of the total length (the caudal not included); dorsal spines rather slender; anal spine shorter than the rays; caudal fin forked. Uniform greyish-olive.

Molucca Sea.

a. Adult. Molucca Sea.

6. Heliastes xanthochir.

Bleeker, Banda, i. p. 248.

D. $\frac{13}{11}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. 3/8.

The height of the body is less than one-half of the total length (without caudal); dorsal spines rather slender, anal spine somewhat shorter than the rays; the length of the pectoral is nearly one-fourth of the total; caudal deeply forked, with the lobes produced. Greenish-olive; axil of the pectoral yellow; a black band along each caudal fin.

East Indian Archipelago.

a. Five and a quarter inches long. From Dr. P. v. Bleeker's Collection.

7. Heliastes analis.

Heliases analis, *Cuv. & Val.* v. p. 496.
—— macrochir, *Bleeker, Amboina,* iv. p. 346.

D. $\frac{13}{11}$. A. $\frac{2}{11}$. L. lat. 26–28.

The height of the body is more than one-half of the total length (the caudal fin not included); pectoral long, its length being contained thrice and two-thirds in the total; caudal deeply forked, with the lobes produced; the second anal spine is rather longer than the rays. Dorsal spines strong. Orange-coloured, back violet.

Amboyna.

a, b. Fine specimens. Amboyna. Purchased of Mr. Frank.

8. Heliastes cæruleus.

Cuv. & Val. v. p. 497; *Schleg. Overz. Amphipr. &c. in Verhand. Nat. Gesch. Nederl. Overz. Bezitt.* p. 25.

D. $\frac{13}{10}$. A. $\frac{2}{11}$.

The height of the body is more than one-half of the total length (the caudal not included); caudal fin deeply forked. Blue: dorsal and anal fins brownish; ventrals and caudal yellow, the latter with the upper and lower margins black.

New Guinea; Ulea; Molucca Sea.

9. Heliastes frenatus.

Cuv. & Val. v. p. 498.

D. $\frac{13}{9}$. A. $\frac{2}{10}$.

Caudal fin deeply forked; a white line from the eye to the extremity of the snout. (*Cuv.*)

Guam.

10. Heliastes xanthurus.

Bleeker, Banda, iii. p. 107.

D. $\frac{13}{10}$. A. $\frac{2}{11}$. L. lat. 28.

The height of the body is one-half of the total length (the caudal fin not included); caudal fin deeply forked. Violet-brown, each scale with a blue dot; tail and caudal fin orange-coloured, the latter with a large irregular spot at the base; dorsal and anal fins black, posteriorly edged with yellow; ventrals brown. (*Bl.*)

Coast of Banda Neira.

11. **Heliastes notatus.**

Schleg. Faun. Japon. Poiss. p. 66.

D. $\frac{13}{13}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. 3/10.

The height of the body is two-fifths of the total length (the caudal fin not included). Teeth in a distinct band, with an outer series of larger ones. The nine posterior dorsal spines are of moderate strength, and nearly equal in length, which is rather more than one-half of that of the head. The soft dorsal and the caudal lobes pointed. Caudal deeply forked; the second anal spine is stronger and somewhat longer than the dorsal spines. Yellowish-olive (in spirits); a round white spot on the back below the end of the dorsal fin; axil of the pectoral brown.

Chinese and Japanese Seas.

a. Five and a quarter inches long. Presented by J. R. Reeves, Esq.

12. **Heliastes lepidurus.**

Heliases lepidurus, *Cuv. & Val.* v. p. 498; *Bleek. Ichth. Sumb. Journ. Ind. Archip.* 1848.
Glyphisodon bandanensis, *Bleek. Banda*, i. p. 248.
Heliases frenatus, *Bleek. Ceram*, ii. p. 710 (not *Cuv. & Val.*).
—— cæruleus, *Bleek. Kokos*, iv. p. 455 (not *Cuv. & Val.*).

D. $\frac{12}{10}$. A. $\frac{2}{10}$. L. lat. 27. L. transv. $\frac{1-2}{8}$.

The height of the body is one-half of the total length (the caudal not included). There is only one distinct series of teeth. Dorsal spines slender; the length of the second anal spine is one-third of that of the head; caudal fin forked, scaly. Greenish-olive, the scales on the head and on the back with a blue dot; a blue line from the orbit across the præorbital; hinder part of the axil black.

Coasts of New Guinea and of the East Indian Archipelago.

a–c. Adult and young. Amboyna. Purchased of Mr. Frank.
d. Half-grown: not good state. From Dr. P. v. Bleeker's Collection as *H. cæruleus*.

13. **Heliastes ternatensis.**

Bleeker, Ternate, vii. p. 377.

D. $\frac{12}{10}$. A. $\frac{2}{10}$. L. lat. 28.

The height of the body is a little more than one-half, or one-half, of the total length (the caudal fin not included). Teeth apparently in one series only. Caudal fin deeply forked; the second anal spine shorter than the first soft ray. Brownish-violet, each scale with a bluish

spot or small transverse streak; dorsal fin violet, the other fins yellowish; the caudal with a brown band along each lobe; axil not black.
Ternate, Booroo, Goram.

a. Not good state. From Dr. P. v. Bleeker's Collection.

14. **Heliastes marginata.**

Heliases marginata, *Casteln. Anim. nouv. Poiss.* p. 9. pl. 3. fig. 1.
Chromis atrilobata, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 149.

D. $\frac{12}{12}$. A. $\frac{2}{12}$. L. lat. 30. L. transv. 3/9.

The height of the body is two-fifths of the total length (without caudal). Teeth in both jaws in a distinct band, with an outer series of stronger ones. Dorsal spines slender; caudal fin deeply forked, with the lobes produced. Greenish-olive above, yellowish on the sides; posterior part of the axil, dorsal fin, and a band along each caudal lobe deep-black; the last three or four dorsal rays and the other fins transparent.
Bahia. Coast of Lower California.

a–b. Fine specimens, 4–4½ inches long. Bahia. From Dr. O. Wucherer's Collection.

A careful comparison of Gill's description does not show any essential point in which the Californian specimen differs from those of Brazil; the former is said to have the snout equal in length to the diameter of the eye whilst the snout of the Brazilian specimens is a little shorter. But when we consider that the typical specimen of *H. atrilobata* is much injured and shrivelled up, we cannot admit this as evidence against the identity of those specimens. This would be another instance of one and the same species inhabiting both sides of America.

15. **Heliastes multilineatus.**

Heliases multilineatus, *Guich. in Sagra, Hist. Cub. Poiss.* p. 76. pl. 2. fig. 2.
Furcaria puncta, *Poey, Mem. Cub.* ii. p. 195; *Gill, Proc. Acad. Nat. Sc. Philad.* 1862, p. 149.

D. $\frac{12}{11}$. A. $\frac{2}{11\text{–}12}$. L. lat. 30. L. transv. 12. Cæc. pylor. 2. Vert. 11/15.

The height of the body is one-third of the total length; caudal lobes equal in length. Teeth in a band. Brown, each scale with the centre darker; pectoral with a large black spot at the base; an orange-coloured spot on the back, immediately behind the dorsal fin; dorsal and caudal fins with yellow edge.
Cuba.

16. **Heliastes cyaneus.**

Furcaria cyanea, *Poey, l. c.* p. 196. tab. 14. figs. 5–8.

D. $\frac{12}{12}$. A. $\frac{2}{12}$.

The height of the body is two-sevenths of the total length; the upper caudal lobe longer than the lower. Teeth in a band. Blue, each scale with the centre darker. (*Poey.*)
Cuba.

Fam. 2. LABRIDÆ.

Labridæ, pt., *Cuv. Règne Anim.*
Labroidei cycloidei, *Müll. Berl. Abhandl.* 1844, p. 166.
Cyclolabridæ, *Owen, Lect. Comp. Anat. Fishes*, p. 48.

Body oblong or elongate, covered with cycloid scales. The lateral line extends to the caudal or is interrupted. One dorsal fin, with the spinous portion as well developed as, or more than, the soft; the soft anal similar to the soft dorsal. Ventral fins thoracic, with one spine and five soft rays. Palate without teeth; only one lower pharyngeal bone without median suture. Branchiostegals five or six; gills three and a half; pseudobranchiæ and air-bladder present. Pyloric appendages none; stomach without cæcal sac.

All the fishes of this family are marine, inhabiting the seas of the temperate and tropical regions, becoming scarcer towards the Arctic portions: none are known from the Arctic and Antarctic seas. Feeding chiefly on mollusca, their dentition is admirably adapted for crushing shells: many species have a strong curved tooth at the posterior extremity of the intermaxillary, for the purpose of pressing a shell against the lateral and front teeth, by which it is crushed. The *Scarina* are herbivorous as well as carnivorous.

The following synopsis of the genera is, in the main, the same as that proposed by me in the Annals and Magazine of Natural History,' 1861, viii. p. 382, but with several alterations, of the necessity of which I have convinced myself by a study of the most elaborate analytical conspectus given by Dr. v. Bleeker in the 'Proceedings of the Zoological Society,' 1861, p. 408. Too much importance appears to me to have been attached, in that paper, to the shape of the lower pharyngeal and to the arrangement of its teeth, a character the systematic value of which I readily admit, so long as it is constantly joined with a second (in *Pseudodacina*, *Scarina*, and *Odacina*). When Dr. v. Bleeker describes these teeth as "*pavimentati*" in his family of *Cossyphiformes*, he must attribute the same character to the genus *Lachnolaimus*, placed by him along with *Labrus*, which has these teeth "*non pavimentati*," although *Lachnolaimus* is certainly merely a modified form of the typical *Labri*. I am inclined to consider *Clepticus* and *Siphonognathus* as being in a similar relation, the former to *Cossyphus* and the latter to *Odax*.

A character which has been entirely overlooked, but which, for the further division of the *Labridæ*, is as important as that taken from the dentition or from the structure of the vertical fins, is that of the number of the vertebræ, the value of which has been maintained by me on several occasions. It will be evident, from the numerous statements contained in the following pages, that in those genera which are composed entirely or for the greater part of tropical species, the vertebral column is composed of 24 or nearly 24 vertebræ, whilst those which are chiefly confined to the temperate seas of the northern or southern hemisphere have that number increased in the abdominal and caudal portions. Not having, at present, quite sufficient materials, I have thought it better not to let this character interfere with the division proposed; but I hope soon to be able to base a revision of the genera and groups on a complete series of skeletons.

A valuable contribution to the knowledge of the pharyngeal apparatus of the Labroids has been given by R. Kner, in 'Sitzgsber. Acad. Wiss. Wien,' xl. 1860, p. 40.

Synopsis of the Groups and Genera.

First Group: **Labrina.**

Dorsal fin many-rayed, composed of more than twenty rays, thirteen of which at least are spinous. All the teeth in the jaws are conical; no posterior canine tooth.

* *Anal spines three.*

Teeth in a single series; cheeks and opercles with imbricate scales; dorsal spines not prolonged. L. lat. more than 40	1. Labrus, p. 69.
Teeth in a single series; cheeks and opercles with imbricate scales; dorsal spines not prolonged. L. lat. less than 40	2. Crenilabrus, p. 77.
Teeth in a single series; cheeks and opercles scaly; anterior dorsal spines much produced.	3. Lachnolaimus, p. 87.
Teeth in a double series; scales on the cheeks rudimentary; opercles naked	4. Tautoga, p. 87.
Teeth in a single series; imbricate scales on the cheeks; operculum with a series of scales along the lower margin, the rest of the opercular apparatus being naked	5. Malacopterus, p. 88.
Teeth of the jaws forming a band; cheeks and opercles scaly	6. Ctenolabrus, p. 88.

** *Anal spines more than three.*

Teeth in the jaws forming a band	7. Acantholabrus, p. 91.
Teeth in a single series	8. Centrolabrus, p. 92.

Second Group: **Chœropina.**

Dorsal fin with twenty rays, thirteen of which are spinous. The lateral teeth are more or less confluent into an obtuse osseous ridge, whilst the anterior remain free, conical.

Cheek elevated	9. Chœrops, p. 93.

Third Group: **Julidina.**

Dorsal fin with less than thirteen spines[*]; anterior teeth free, conical (compressed in *Anampses*); teeth of the lower pharyngeal not confluent or pavement-like.

* *Eleven or twelve (ten) dorsal spines; lateral line not interrupted; cheeks and opercles scaly.*

The membrane of the soft dorsal scaleless; both limbs of the præoperculum naked; a posterior canine tooth. L. lat. 26–28	10. Xiphochilus, p. 98.
The membrane of the soft dorsal scaleless; both limbs of the præoperculum naked; no posterior canine tooth	11. Semicossyphus, p. 99.

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[*] Thirteen occasionally in *Cossyphus rufus* and in *Cossyphus tredecimspinosus*.

Base of the soft dorsal naked; both limbs of the præoperculum naked, not serrated. L. lat. 45–62; a posterior canine tooth	12. Trochocopus, p. 100.
The membrane of the soft dorsal scaleless; præoperculum with the lower limb scaly, and with the posterior naked and serrated	13. Decodon, p. 101.
Base of the dorsal fin scaly. D. $\frac{10-11}{11-10}$. A. $\frac{3}{10}$. Præoperculum serrated	14. Pteragogus, p. 101.
The membrane of the soft dorsal is scaly at the base; dorsal spines twelve	15. Cossyphus, p. 102.
The soft dorsal is enveloped in scales; teeth very small	16. Clepticus, p. 111.

** *Nine dorsal spines; lateral line not interrupted; cheeks and opercles scaly.*

Præoperculum not serrated; scales large; teeth in the jaws in a single series	17. Labrichthys, p. 112.
A pair of curved, erect fangs in each jaw; the other teeth minute, forming a band; scales of moderate size	18. Labroides, p. 118.
Præoperculum serrated	19. Duymæria, p. 120.

*** *Nine to eleven dorsal spines; lateral line interrupted; cheeks and opercles scaly.*

Eleven dorsal spines	20. Cirrhilabrus, p. 123.
The middle of the spinous dorsal is strongly depressed	21. Doratonotus, p. 124.
The third anal spine is the longest; nine or ten dorsal spines, which are subequal in length; lower jaw not produced backwards	22. Cheilinus, p. 125.
The second anal spine is the longest; nine dorsal spines	23. Pseudocheilinus, p. 134.
The lower jaw much produced backwards	24. Epibulus, p. 134.

**** *Eight or nine dorsal spines; head entirely naked or with only a few very small scales, either on the cheek or on the operculum.*

Nine dorsal spines; each jaw with two compressed cutting teeth anteriorly	25. Anampses, p. 135.
Nine dorsal spines; opercles naked, cheek with a strip of very small scales; scales of moderate size	26. Hemigymnus, p. 138.
Scales in the thoracic region as large as, or larger than, those on the side of the body: scales rather large	27. Stethojulis, p. 140.
Nine dorsal spines; head entirely naked*; scales of moderate size, those in the thoracic region smaller than those on the side of the body; lateral line continuous; anterior teeth conical, not bent backwards and outwards; a posterior canine tooth	23. Platyglossus, p. 143.
Nine dorsal spines; head entirely naked; scales of moderate size, those in the thoracic region smaller than those on the side of the body;	

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* Except in *H. hortulanus* and *H. notophthalmus*.

lateral line continuous; the outer anterior canine teeth bent outwards and backwards; a posterior canine tooth	29. Leptojulis, p. 167.
Nine dorsal spines; head entirely naked; scales of moderate size; lateral line continuous; anterior teeth conical; no posterior canine tooth.	30. Pseudojulis, p. 168.
Nine dorsal spines; scales of moderate size, lateral line interrupted	31. Novacula, p. 168.
Eight dorsal spines; snout of moderate extent.	32. Julis, p. 179.
Snout very much produced	33. Gomphosus, p. 192.
Cheeks naked, operculum with a single series of very small scales; body elongate, head low...	34. Cheilio, p. 194.
Scales small, lateral line continuous	35. Coris, p. 195.
Scales small, lateral line interrupted	36. Cymolutes, p. 207.

Fourth Group: **Pseudodacina.**

Each jaw armed with two pairs of broad incisors and with a cutting lateral edge; teeth of the lower pharyngeal confluent, pavement-like.

Eleven dorsal spines	37. Pseudodax, p. 208.

Fifth Group: **Scarina**

The teeth in both jaws are intimately soldered together into a broad, convex, cutting lamina, and sometimes are entirely indistinct; pharyngeal teeth pavement-like. Scales rather large. From eight to ten dorsal spines.

Cheek with a single series of scales; upper lip double in its whole circuit: dorsal spines pungent; the lower jaw projecting beyond the upper	38. Scarus, p. 208.
Cheek with a single series of scales; upper lip double in its whole circuit; dorsal spines flexible; anterior teeth soldered together, those of the lower jaw disposed in very oblique series	39. Scarichthys, p. 212.
Cheek with a single series of scales; upper lip double only posteriorly; jaws with distinct, oblong, imbricate teeth anteriorly	40. Callyodon, p. 213.
Cheek with a single series of scales; upper lip double only posteriorly; teeth of the lower jaw distinct, disposed in oblique series	41. Callyodontichthys, p. 216.
Cheek with two to four series of scales	42. Pseudoscarus, p. 216.

Sixth Group: **Odacina.**

The edge of each jaw is sharp, cutting, without distinct teeth anteriorly; pharyngeal teeth pavement-like. Scales small or rather small. Dorsal spines numerous and flexible.

Cheeks and opercles scaly; snout conical, but with the upper jaw not produced..............	43. Odax, p. 240.

Head nearly entirely naked; scales small	44. CORIDODAX, p. 243.
Head entirely naked; scales of moderate size...	45. OLISTHEROPS, p. 243.
Upper jaw terminating in a pointed appendage	46. SIPHONOGNATHUS, p. 243.

First Group. LABRINA.

1. LABRUS*.

Labrus, sp., *Artedi, Genera*, p. 33.

Labrus, *Cuv. Règne Anim.*; *Cuv. & Val.* xiii. p. 16; *Bleek. Proc. Zool. Soc.* 1861, p. 417.

Body compressed, oblong, covered with scales of moderate size, in more than forty transverse series; snout more or less pointed; imbricate scales on the cheeks and opercles, none or only a few on the interoperculum. Teeth in the jaws conical, in a single series. Dorsal spines numerous, thirteen to twenty-one, none of which are prolonged; anal spines three. Lateral line not interrupted.

Coasts of the temperate parts of Europe and Africa.

Skeleton of Labrus mixtus.—When we compare the skeleton of one of the typical Labroids with that of a true Acanthopterygian similar in external appearance, as for instance with that of *Dentex vulgaris* or *Sargus vulgaris*, we do not find greater differences in the structure of the skull than we may expect between two closely allied genera. Besides the pharyngeal bones, it is only the basioccipital which shows some peculiarity, in having on each side a large, flattish condyle, fitting into a concavity of the upper pharyngeals; or, in other words, there is a joint between the bones mentioned, whilst in those Acanthopterygians the pharyngeals are fixed to the basioccipital by a very loose cellular tissue.

The bones of the upper jaw are very similar to those of *Sargus*, but more elongate. Both fishes require strong jaws for crushing the hard substances which form a part of the animals on which they feed; the front part of the intermaxillary is dilated, not only to form a base for the strong teeth in function, but also to afford space for the germs of teeth which are developed in the interior of the bone; the latter teeth enter the series from the outer surface of the bone. The maxillary is strongly curved, a shape by which the protraction of the mouth is essentially facilitated; the process of the palatine to which the maxillary is joined is much produced forward.

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* 1. Labrus luscus, *L. Mus. Ad. Fred.* ii. p. 80, and *Syst. Nat.* i. p. 478; *Bl. Schn.* p. 253; *Risso, Ichth. Nice*, p. 217; *Cuv. & Val.* xiii. p. 69.—Mediterranean.
2. —— lineolatus, *Cuv. & Val.* xiii. p. 90.—Mediterranean.
3. —— saxorum, *Cuv. & Val.* xiii. p. 91.—Mediterranean.
4. —— jagonensis, *Bowd. Excurs. Mad. & Porto Santo*, p. 234. fig. 47 (fig. and description very bad); *Cuv. & Val.* xiii. p. 100.—Porto Praya. Perhaps identical with *L. mixtus*.
5. —— microlepidotus, *Bl.* taf. 292; *Bl. Schn.* p. 250.—Cossyphus microlepidotus, *Cuv. & Val.* xiii. p. 140.—*Hab.* ——?

The proportion of the vertebræ is very characteristic: the abdominal portion is composed of eighteen and the caudal of twenty-one vertebræ—the length of the former being to that of the latter as 1 : 1·15.

1. Labrus maculatus.

The Ballan Wrasse.

Labrus bergylta, *Ascan. Ic.* tab. 1; *Cuv. & Val.* xiii. p. 20; *Yarr. Brit. Fish.* i. p. 275, 2nd edit. i. p. 311, 3rd edit. i. p. 482.

—— maculatus, *Bl.* vi. p. 17. taf. 294; *Bl. Schn.* p. 250; *Fries och Ekstr. Skand. Fisk.* p. 43. tab. 2; *Jen. Man.* p. 391; *Parn. Wern. Mem.* vii. p. 256, and *Fish. Firth of Forth,* p. 96; *Nilss. Prodr.* p. 74, and *Skand. Faun.* iv. p. 261.

—— aper, *Retz. Faun. Suec.* p. 335.

—— ballan, *Art. Walb.* iii. p. 259; *Bl. Schn.* p. 252; *Lacép.* iii. p. 513.

Ballan Wrasse, *Penn. Brit. Zool.* iii. p. 216. pl. 44, and edit. 1812, iii. p. 334. pl. 55.

Vieille, *Duham. Pêches,* iii. sect. iv. p. 34. pl. 6. fig. 1.

Labrus berg-galt, *Müll. Zool. Dan. Prodr.* p. 46.

—— neustriæ, *Lacép.* iii. p. 522.

—— tancoïdes, *Lacép.* iii. p. 501.

—— tinca, *Shaw, Nat. Misc.* xi. pl. 426, and *Zool.* iv. p. 499. pl. 72; *Donov. Brit. Fish.* iv. p. 83.

—— ballanus, *Shaw, Zool.* iv. p. 398.

—— balanus, *Flem. Brit. An.* p. 209.

—— lineatus, *Donov. Brit. Fish.* iv. pl. 74; *Turton, Brit. Faun.* p. 99; *Flem. Brit. An.* p. 209; *Jen. Man.* p. 392; *Yarr. Brit. Fish.* edit. 1. i. p. 279.

—— cornubiensis, *Couch, Trans. Linn. Soc.* xiv. p. 80.

—— variabilis, *Thomps. Nat. Hist. Irel.* iv. p. 120.

Young.

Labrus pusillus, *Jenyns, Catal. Brit. Vert.* p. 25, and *Man.* p. 392; *Yarrell, Brit. Fish.* edit. 2. i. p. 330.

Crenilabrus multidentatus, *Thomps. Proc. Zool. Soc.* 1837, p. 56, and *Mag. Zool. & Bot.* ii. p. 449. pl. 13, and *Ann. & Mag. Nat. Hist.* 1839, ii. p. 418.

—— pusillus, *White, Catal. Brit. Fish.* p. 24; *Yarr. Brit. Fish.* 3rd edit. i. p. 506.

D. $\frac{(19)\,20\,(21)}{10\text{–}11}$. A. $\frac{3}{9\,(8)}$. L. lat. 45. L. transv. 6–7/14. Vert. 19/19*.

The height of the body equals the length of the head, and is contained thrice and three-fourths in the total. The width of the interorbital space is two-thirds of the extent of the snout, which is one-third of the length of the head. Ground-colour bluish-green or reddish-brown, more or less distinctly reticulated with yellow or orange-red; vertical fins bluish-green, sometimes spotted; pectorals and ventrals orange-red.

European coasts. Mediterranean. North-west coast of Africa.

a–c. Adult: skins and stuffed. Firth of Forth. From Dr. Parnell's Collection.

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* Valenciennes states 20 vertebræ, an error copied by Yarrell.

d. Fine specimen. Brighton. Presented by Dr. A. Günther.
e. Two feet long: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
f–r. Adult, half-grown, and young: stuffed and skins. Plymouth.
s–u. Adult and half-grown. Polperro. Presented by J. Couch, Esq.
v–γ. Adult, half-grown, and young: skins. British coast. From Mr. Yarrell's Collection.
δ. Adult: skin. English coast. Purchased.
ε. Half-grown: skin. English coast. Purchased.—D. 19/11.
ζ. Young. Devonshire. Presented by — Ross, Esq. Named *Labrus lineatus*.
η, θ. Half-grown. England. From the Haslar Collection.
ι. Half-grown. Gibraltar. From the Haslar Collection.
κ–μ. Half-grown. Mogador. Presented by the Rev. R. T. Lowe.
ν, ξ, ο, π. Adult and half-grown.
ρ–υ. Adult: stuffed.
φ, χ. Half-grown and young. From the Haslar Collection.

Young specimens show the præoperculum very distinctly serrated; and traces of the serrature may be frequently found in specimens of four to six inches in length, if the skin covering the præopercular edge is removed. Such specimens have been described as *Labrus pusillus* and *Crenilabrus multidentatus*.

2. Labrus donovani.

Cuv. & Val. xiii. p. 39.

$$D. \frac{20}{10-11}. \quad A. \frac{3}{9}.$$

The height of the body equals the length of the head, and is contained thrice and three-fourths in the total; the length of the snout is one-third of that of the head. Upper parts and fins green, a silvery band along the sides; head with some irregular blue lines. (*Val.*)

Coasts of Bretagne.

It is very probable that the *Labrus comber* of Pennant (Brit. Zool. iii. p. 221. pl. 47, and edit. 1812, iii. p. 342. pl. 58) has been founded on a specimen of this species.

3. Labrus turdus.

? Exocœtus, *Rondel.* vi. c. 15. p. 193.
Turdus viridis minor, *Willughby*, p. 320.
? Turdus viridis major, *Willughby*, p. 322; *Ray, Syn.* p. 137.
Labrus, no. 2, *Artedi, Genera*, p. 34.
? Labrus, no. 11, *Artedi, Synon.* p. 57; & no. 5, *Genera*, p. 34.
? Labrus turdus, *L. Syst. Nat.* i. p. 478; *Bl. Schn.* p. 257; *Risso, Ichth. Nice*, p. 278, and *Eur. Mérid.* iii. p. 303.
Labrus viridis, *L. Syst. Nat.* i. p. 478; *Risso, Ichth. Nice*, p. 221.
—— psittacus, *Lacép.* iii. p. 501.
? Labrus saxatilis, *Risso, Eur. Mérid.* iii. p. 300.

Labrus turdus, *Cuv. & Val.* xiii. p. 62; *Guichen. Explor. Algér. Poiss.* p. 84; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 449.
? Labrus viridis, *Cuv. & Val.* xiii. p. 75. pl. 370.

D. $\frac{17-19}{14-11}$. A. $\frac{3}{10-11}$. L. lat. 45. L. transv. 5/13. Vert. 20/21.

The height of the body is contained four times and a half in the total length, the length of the head three times and two-thirds. The width of the interorbital space is one-half of the extent of the snout, which is more than one-third of the length of the head (in adult specimens). The length of the longest dorsal ray is less than that of the base of the soft dorsal fin. Greenish, generally with a silvery band along the sides, which is edged with brown on the head. Fins generally immaculate. Head and back sometimes marbled with brown.

Mediterranean.

a. Adult: bad state. Malta. From the Haslar Collection.
b. Thirteen inches long: skin. Mediterranean. From Mr. Yarrell's Collection.
c. Six inches long. Coast of Barbary.
d. Six inches long. Old Collection.
e–g. Twelve and eight inches long: stuffed.
h, i. Half-grown: not good state.

Specimens *c* & *d* show the præoperculum finely but very distinctly serrated.

4. Labrus festivus.

Turdus oblongus fuscus, maculosus, *Willughby*, p. 323; *Ray*, p. 137.
——, no. 11 (Labrus turdus), var., *Artedi, Syn.* p. 57.
Labrus festivus, *Risso, Eur. Mérid.* iii. p. 304; *Cuv. & Val.* xiii. p. 71.

D. $\frac{18}{13}$. A. $\frac{3}{11}$. L. lat. 45. L. transv. 6/13.

The height of the body is contained four times and two-thirds in the total length, the length of the head three times and two-thirds. The width of the interorbital space is one-half of the length of the snout, which is more than one-third of that of the head. The length of the longest dorsal ray equals that of the base of the soft dorsal fin. Reddish-olive on the back, the scales becoming gradually silvery towards the belly; an indistinct silvery band along the side of the body; præorbital with irregular brown bands; the lower half of the side of the head reticulated with orange-yellow. The soft parts of the vertical fins with pearl-coloured ocelli edged with violet.

Mediterranean.

a. Fine specimen, 12 inches long. Cannes. Presented by Th. Günther, M.D.

5. Labrus merula.

Merula, *Aldrov.* i. c. 6. p. 35; *Rondel.* vi. c. 5. p. 172.
Turdus niger, *Willughby*, p. 320; *Ray*, p. 137.
Labrus, no. 7, *Artedi, Syn.* p. 55.
—— merula, *L. Syst. Nat.* i. p. 480; *Cuv. & Val.* xiii. p. 80; *Cuv. Règne Anim. Ill. Poiss.* pl. 86. fig. 1.

Labrus livens, *Brünn. Pisc. Mass.* p. 53 (not *L.*).
Scarus, sp., *Gronov. Zoophyl.* no. 228.
Labrus ossiphagus, *Risso, Ichth. Nice,* p. 223 (not *L.*).
—— lividus, *Cuv. & Val.* xiii. p. 87.
—— limbatus, *Cuv. & Val.* xiii. p. 89.
Scarus viridis, *Gronov. Syst. ed. Gray,* p. 63.

D. $\frac{17\text{-}19}{12}$. A. $\frac{3}{(9\text{-})10}$. L. lat. 43. L. transv. 6/14. Vert. 18/20.

The height of the body equals the length of the head, and is contained thrice and three-fourths in the total. The width of the interorbital space is two-thirds of the extent of the snout, which is one-third of the length of the head. The length of the longest ray of the soft dorsal fin equals the length of its base. Uniform brown (in spirits), or greenish-olive with some obscure blackish blotches.

Mediterranean.

a. Adult female. Cannes. Presented by Th. Günther, M.D.
b. Adult. Nice. From the Berlin Museum.
c, d. Adult. Egypt. From Mr. Petherick's Collection.
e. Half-grown. Mediterranean. From Dr. P. v. Bleeker's Collection.
f. Half-grown: skin. From Gronow's Collection.
g. Young: stuffed. From Mr. Yarrell's Collection.

6. **Labrus reticulatus**

? Labrus nereus, *Risso, Ichth. Nice,* p. 231, and *Eur. Mérid.* iii. p. 302; *Cuv. & Val.* xiii. p. 78.
Labrus reticulatus, *Lowe, Trans. Zool. Soc.* iii. p. 11, and *Proc. Zool. Soc.* 1839, p. 85.
—— nubilus, *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 62.

D. $\frac{19}{11}$. A. $\frac{3}{9}$. L. lat. 43. L. transv. $\frac{5\text{-}6}{13}$.

The height of the body is contained four times or three times and two-thirds in the total length, and equals the length of the head. The width of the interorbital space is two-thirds of the extent of the snout, which is one-third of the length of the head. The longest dorsal ray is longer than the base of the soft dorsal fin (in adult specimens). Brownish, reticulated with dark chestnut-brown lines, each scale having a pale centre; irregular dark-brown spots on the side of the snout and behind the orbit. Vertical fins immaculate or spotted.

Mediterranean. Madeira.

a. Seventeen inches long: stuffed. Madeira. From the Rev. R. T. Lowe's Collection.—Type of the species.
b. Fifteen inches long. Madeira. From the Rev. R. T. Lowe's Collection.
c. Seven inches long. Mediterranean. From the Haslar Collection.
d. Five inches long. Alexandria. From the Berlin Museum.—This specimen has a very distinct silvery longitudinal band, as in *L. turdus*; traces of which, and the brown edges on the snout are still visible in specimen *c*. The præoperculum is finely but very distinctly serrated.—D. $\frac{19}{11}$.

e, f. Four to five inches long Sicily. Presented by W. Swainson, Esq.—These specimens agree with the former, but D. $\frac{18}{12}$.

7. **Labrus prasostictus.**

Labrus prasostictes, *Pall. Zoogr.* iii. p. 272; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 445, *Poiss.* pl. 16. fig. 2.
—— rufus, *Rathke, Fauna der Krym*, p. 337.

D. $\frac{17-18}{12}$. A. $\frac{3}{9}$.

The height of the body is somewhat more than the length of the head and two-sevenths of the total. Snout one-third of the length of the head. The length of the longest ray of the soft dorsal fin is less than that of its base (according to the figure quoted). Green, during life, with series of blue dots or ocelli on head, body and fins; pectorals immaculate; dorsal with a red, anal and caudal with a blue margin; lower parts reticulated with brownish. Brownish, in spirits, reticulated with darker.

Black Sea.

8. **Labrus crassus.**

Agass. in Spix, Pisc. Brasil. p. 95. tab. 52.

D. $\frac{17}{14}$. A. $\frac{3}{11}$.

The height of the body is contained thrice and two-thirds in the total length, the length of the head four times; snout of moderate extent. The length of the longest dorsal ray is rather less than one-half that of the base of the soft portion. (*Agass.*)

? Coast of Brazil.

The typical specimen is in the Museum of Munich.

9. **Labrus mixtus.**

Striped Wrasse. Red Wrasse.
Labrus mixtus, *Fries och Ekstr. Skand. Fisk.* p. 160. pls. 37 & 38 (Labrus dispar); *Nilss. Skand. Faun.* iv. p. 265.

Male.

Turdus perbelle pictus, *Willughby*, p. 322 (not fig.).
—— major varius, *Willughby*, p. 322.
Labrus, no. 3, *Artedi, Genera*, p. 34.
——, no. 4, *Artedi, Genera*, p. 34.
—— mixtus, *L. Syst. Nat.* i. p. 479; *Lacép.* iii. p. 436; *Risso, Ichth. Nice*, p. 222; *Cuv. & Val.* xiii. p. 43; *Yarrell, Brit. Fish.* i. p. 281, 2nd edit. i. p. 317, 3rd edit. i. p. 491; *Guichen. Explor. Algér. Poiss.* p. 83.
? Labrus ossiphagus, *L. Syst. Nat.* i. p. 478; *Bl. Schn.* p. 268; *Lacép.* iii. p. 440.
—— cœruleus, *Ascan. Ic.* pl. 12.
Blaastaal, *Ström, Söndm.* i. p. 269.
Striped Wrasse, *Penn. Brit. Zool.* iii. p. 218. pl. 45, and edit. 1812, iii. p. 337. pl. 57.
The Cook, *Penn. Brit. Zool.* iii. p. 253, and edit. 1812, iii. p. 340; *Bl. Schn.* p. 268.

Labrus variegatus, *L. Gm.* i. p. 1294; *Lacép.* iii. pp. 442, 508; *Donov. Brit. Fish.* i. pl. 21; *Risso, Ichth. Nice*, p. 229; *Turt. Brit. Faun.* p. 99; *Jenyns, Man.* p. 394; *Thomps. Nat. Hist. Irel.* iv. p. 124.
—— coquus, *Art. Walb.* iii. p. 260; *Lacép.* iii. p. 443; *Turt. Brit. Faun.* p. 99; *Flem. Brit. Anim.* p. 209.
—— vittatus, *Art. Walb.* iii. p. 256.
—— vetula, *Bl.* taf. 293; *Bl. Schn.* p. 250; *Lacép.* iii. p. 447.
Grammistes variegatus, *Bl. Schn.* p. 190.
Sparus formosus, *Shaw, Nat. Misc.* i. pl. 31 (cop. *Ascan.*).
Labrus formosus, *Shaw, Zool.* iv. p. 512.
—— pavo, *Risso, Eur. Mérid.* iii. p. 299 (not *Ichth. Nice*).
—— lineatus, *Risso, Ichth. Nice*, p. 220.
—— larvatus, *Lowe, Proc. Zool. Soc.* 1850, p. 249.

Female.

Labrus carneus, *Ascan. Ic.* tab. 13; *Bl.* taf. 289; *Bl. Schn.* p. 249; *Parn. Wern. Mem.* vii. p. 258, and *Fish. Firth of Forth*, p. 98.
—— trimaculatus, *L. Gm.* i. p. 1294; *Lacép.* iii. p. 488; *Shaw, Nat. Misc.* xix. pl. 786; *Risso, Ichth. Nice*, p. 219; *Donov. Brit. Fish.* iii. pl. 49; *Cuv. & Val.* xiii. p. 58; *Turton, Brit. Faun.* p. 99; *Jen. Man.* p. 396; *Yarr. Brit. Fish.* i. p. 286, 2nd edit. i. p. 320, 3rd edit. i. p. 495; *Guichen. Explor. Algér. l. c.*; *Thomps. Nat. Hist. Irel.* iv. p. 126; *Delaroche, Ann. Mus.* 1809, xiv. p. 281 (air-bladder).
—— exoletus, fem., *Retz. Faun. Suec.* p. 335.
Trimaculated Wrasse, *Penn. Brit. Zool.* iii. p. 218. pl. 46, and edit. 1812, iii. p. 336. pl. 56.

Variety of Female.

Labrus bimaculatus, *L. Syst. Nat.* i. p. 477; *Bl. Schn.* p. 261; *Turt. Brit. Faun.* p. 99; *Jen. Man.* p. 396.
Bimaculated Wrasse, *Penn. Brit. Zool.* iii. p. 247, and edit. 1812, iii. p. 335.
Labrus quadrimaculatus, *Risso, Eur. Mérid.* iii. p. 302.

D. $\frac{16\text{–}18}{14\text{–}11}$. A. $\frac{3}{11}$. L. lat. 55. L. transv. 7/20. Vert. 18/21.

The height of the body is contained four times and a third or four times and a quarter in the total length, the length of the head three times and a third to three times and a half. The width of the interorbital space is contained once and two-thirds or twice in the length of the snout. Snout elongate, its length being considerably more than one-third of that of the head. Caudal and anal and sometimes the other fins with a more or less broad blue margin; a black or bluish-black oblong spot or band along the base of the anterior dorsal spines. *Male* with blue streaks or a blackish band along the body, sometimes nearly uniform. *Female* with two or three large black blotches across the back of the tail.

Coasts of Europe.

Males.

Var. *a*. Body with irregular blue longitudinal streaks; the lower part of the anterior half or third of the spinous dorsal black; anal and caudal fins with blue margins.

a. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.

b. Adult. English coast. Presented by Messrs. Oliffe & Cole.
c–f. Adult: stuffed and skins. British coast.
g. Adult. Dalmatia.
h. Adult.
i. Adult: skeleton.

Var. *β*. Body nearly uniform; the lower part of nearly the entire spinous dorsal black; anal and caudal fins with blue margins.

k–l. Adult: stuffed.
m. Adult.

Var. *γ*. Yellow: head, back of the trunk, and anterior portion of the spinous dorsal fin blackish-violet; head with some irregular blue streaks. Vertical fins and pectorals with blue margins. (*Labrus larvatus*, Lowe.)

n–o. Fine specimens. Lisbon. Presented by the Rev. R. T. Lowe.
p. Fine specimen. Cannes. Presented by Th. Günther, M.D.

Var. *δ*. Greenish: head, back of the trunk, and anterior portion of the spinous dorsal brownish, the former with irregular bluish lines; a broad brown longitudinal band to the base of the caudal fin. Vertical fins with blue margins.

q. Fine specimen. London market. Presented by Messrs. J. & C. Grove.
r–u. Adult and half-grown: stuffed and skins. Plymouth.
v. Half-grown: skin. From Mr. Yarrell's Collection as *Labrus lineatus*.

Females.

Var. *ε*. Like var. *δ*, but with two or three rather indistinct dark spots on the back of the tail.

w–x. Half-grown: skins. Plymouth. From Mr. Yarrell's Collection.
y. Adult: stuffed. Killough, Ireland.

Var. *ζ*. Red or reddish, with one to three large black spots on the back of the tail; a blackish spot anteriorly on the spinous dorsal fin; vertical fins edged with blue.

z. Half-grown: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
α. Adult: skin. South Devon. From Mr. Yarrell's Collection.
β. Half-grown. Swansea. Mus. Leach.
γ. Adult: stuffed. English coast.
δ. Fine specimen. Cannes. Presented by Th. Günther, M.D.
ε. Half-grown. Malta. Presented by Capt. Strickland, R.N.
ζ. Adult. Dalmatia.
η. Adult. Adriatic.
θ. Half-grown. Mediterranean.
ι, *κ*. Half-grown.
λ. Half-grown: stuffed.
μ. Young: skin. From Mr. Yarrell's Collection.

For description of *Skeleton*, see p. 69.

2. CRENILABRUS*.

Crenilabrus, *Cuv. Règne Anim.*; *Cuv. & Val.* xiii. p. 146; *Bleek. Proc. Zool. Soc.* 1861, p. 417.
Coricus, *Cuv. Règne Anim.*; *Cuv. & Val.* xiii. p. 253; *Bleek. Proc. Zool. Soc.* 1861, p. 417.

Body compressed, oblong, covered with scales of moderate size, in less than forty transverse series; snout more or less pointed; imbricate scales on the cheeks and on all the opercles. Teeth in the jaws conical, in a single series. Dorsal spines numerous, 13–18, none of which are prolonged; anal spines three. Lateral line not interrupted.

Coasts of the temperate parts of Europe and Africa.

Cuvier has separated the genus *Crenilabrus* from *Labrus* on account of the denticulated præoperculum. Having observed the præoperculum to be serrated in young specimens of Cuvier's true *Labri*, whilst several *Crenilabri* lose the serrature of that bone in old age, I formerly refused to acknowledge the validity of the two genera. Dr. v. Bleeker, however, has shown (*l. c.*) that there are other distinctive characters, and has particularly directed attention to the number of scales. He also adopts the genus *Coricus*; but this fish is so closely allied to *Crenilabrus ocellatus*, that the single character of the snout being more or less produced does not appear to me to be of generic value.

The *vertebral column* of the different species of *Crenilabrus* is composed of nearly the same number of vertebræ, viz. of fifteen or fourteen in the abdominal portion, and of eighteen or seventeen in the caudal. The length of the former is to that of the latter,

in *C. pavo*, as .... 1 : 1·2.
in *C. melops*, as .... 1 : 1·26
in *C. quinquemaculatus*, as .... 1 : 1·4.
in *C. griseus*, as .... 1 : 1·27.

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* 1. Lutjanus virescens, *Bl.* taf. 254.—Labrus virescens, *Bl. Schn.* p. 249.—Crenilabrus virescens, *Cuv. & Val.* xiii. p. 182.—*Hab.* ——?
2. Crenilabrus chrysophrus, *Risso, Eur. Mérid.* iii. p. 319.—*Cuv. & Val.* xiii. p. 190.—Nice.
3. Lutjanus olivaceus, *Risso, Ichth. Nice*, p. 279 (not *Lacép.*).—Crenilabrus rissoi, *Cuv. & Val.* xiii. p. 197.—These names have probably been given to specimens of *Cr. ocellatus* and young specimens of other species.
4. —— notatus, *Bl.* taf. 251. fig. 2.—Labrus notatus, *Bl. Schn.* p. 248.—Crenilabrus notatus, *Cuv. & Val.* xiii. p. 217.—*Hab.* ——?
5. —— chlorosochrus, *Risso, Ichth. Nice*, p. 275. pl. 8. fig. 27.—Crenilabrus chlorosochrus, *Risso, Eur. Mérid.* iii. p. 327. pl. 10. fig. 24; *Cuv. & Val.* xiii. p. 215.—Mediterranean.
6. Crenilabrus arcuatus, *Risso, Eur. Mérid.* iii. p. 328; *Cuv. & Val.* xiii. p. 216.—Mediterranean.
7. —— zeraphinus, *Gulia, Tentamen*, p. 13.—Malta.
8. —— schemberianus, *Gulia, l. c.*—Crenilabrus dubius, *Gulia, l. c.*—Malta.
9. —— serranus, *Gulia, l. c.* p. 14.—Malta.
10. —— serranoides, *Gulia, l. c.* p. 15.—Malta.
11. —— intermedius, *Gulia, l. c.*—Malta.
12. —— locaninus, *Gulia, l. c.* p. 16.—Malta.
13. —— propinquus, *Gulia, l. c.* p. 17.—Malta.

1. Crenilabrus pavo.

Pavo, *Salv.* fig. 233; *Aldrov.* i. cap. 4. p. 29; *Willughby*, tab. x. 3 (not descr.).
? Turdus, *Bellon.* p. 160; *Rondel.* iv. cap. 6. pp. 174, 175.
Paon de mer, *Belon, Hist. nat. Poiss. étrang.* p. 18.
Turdus vulgatissimus, etc., *Willughby*, p. 319; *Ray*, p. 136.
Labrus pavo, *Brünn. Ichthyol. Mass.* p. 49 (not *L.*).
? Labrus lapina, *Forsk.* p. 36; *Bl. Schn.* p. 260.
Lutjanus linckii, *Bloch*, iv. p. 127. taf. 252.
Labrus violaceus, *Bl. Schn.* p. 248.
Lutjanus geoffroyius, *Risso, Ichth. Nice*, p. 261. pl. 8. fig. 25.
? Lutjanus lapina, *Risso, l. c.* p. 262.
Crenilabrus geoffroi, *Risso, Eur. Mérid.* iii. p. 314.
—— lapina, *Risso, l. c.* p. 313 (?); *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 451. pl. 19; *Kessler, Bull. Soc. Nat. Mosc.* 1859, 2. p. 444.
Labrus polychrous, *Pall. Zoogr. Ross.-As.* iii. p. 262.
Crenilabrus pavo, *Cuv. & Val.* xiii. p. 149. pl. 372; *Guichen. Explor. Algér. Poiss.* p. 85.

B. 5. D. $\frac{(16)\ 15\ (14)}{10\text{–}11}$. A. $\frac{3}{(9)\ 10\text{–}11}$. L. lat. 35. L. transv. $\frac{3\frac{1}{2}\ (4\frac{1}{2})}{10\text{–}11}$.
Vert. 15/18.

The height of the body is contained thrice and a half or thrice and two-thirds in the total length. Cheek with four or five series of small scales, the scaly part below the eye being higher than the orbit. The length of the snout is more than one-third of that of the head. The serrature of the præoperculum disappears in old specimens. Coloration variable: ground-colour green or brownish, with longitudinal series of blue and red (in spirits brownish) dots; two of these series form the edges of a light band running from the eye to the caudal fin; generally a dark blotch above the axil; vertical fins dotted with blue, pectorals uniform yellow or transparent. Other specimens have the colours less bright and are more uniform.

Mediterranean; Black Sea.

a. Adult. Gibraltar. Presented by Dr. P. L. Sclater.
b, c. Fine specimens. Cannes. Presented by Th. Günther, M.D.
d–e. Fine specimens. Dalmatia.
f, g–h. Adult and half-grown. Trieste. From the Berlin Museum.
i–m. Half-grown. Malta. From the Berlin Museum.
n, o, p. Adult. Egypt. From Mr. Petherick's Collection.
q. Adult. Mediterranean. From the Berlin Museum.
r. Fine specimen. From the Haslar Museum.
s, t–u, v. Adult.
w. Sixteen inches long: stuffed.
x. Adult: skin. From Mr. Yarrell's Collection.
y. Adult: skeleton. Nice. From the Berlin Museum.

For a long time I thought that two or three species were confounded under the name of *Cr. pavo*, and that their distinctive characters might be found in the colours, in the numbers of the soft dorsal and anal rays, and in the number of scales above the lateral line. A further examination, however, of numerous examples has shown me that none of these characters are constantly joined with a second, and that such variations occur in specimens caught together at the same locality and otherwise quite identical. One of the most singular varieties is the specimen *b*, from Cannes, with $4\frac{1}{2}$ longitudinal series of scales above the lateral line. Specimen *c*, procured by my brother at the same time and at the same place, has the scales above the lateral line as large as in the other specimens; and there can be scarcely any doubt that both are specifically identical. The colours are given below.

a. Colours of specimen n. (male), seven inches long.—Pectoral yellow; a blackish blotch above the pectoral. Green, each scale with a bluish spot; three red longitudinal bands: one on the back, along the base of the dorsal fin, the second immediately above the lateral line and along the back of the tail, the third along and below the caudal portion of the lateral line; snout violet; numerous bright-red dots behind the eye. The spinous dorsal dark-violet, with a series of red spots, a blue intramarginal line and a red margin; the soft dorsal and the anal green below and reddish above, with many blue ocelli. The caudal and ventral red at the base and yellow in their outer half, with numerous blue ocelli.

b. Colours of specimen b, from Cannes.—Pectoral transparent; a blackish blotch above the pectoral, another smaller one at the root of the caudal below the end of the lateral line. Reddish-olive above and on the sides, silvery below; a light shining silvery band runs from the eye to the middle of the caudal, and is bordered by two purplish bands—the upper along the anterior portion of the lateral line and the back of the tail; three series of large blackish blotches on the sides. The soft portions of the vertical fins with small ocelli in moderate number.

2. Crenilabrus mediterraneus.

Perca mediterranea, *L. Mus. Ad. Fred.* ii. p. 85, and *Syst. Nat.* i. p. 485.
Labrus, *Brünn. Pisc. Mass.* p. 56. no. 72.
Labrus unimaculatus, *Brünn. Pisc. Mass.* p. 57. no. 73; *Bl. Schn.* p. 255.
Lutjanus bidens, *Bl.* taf. 251. fig. 1.
Labrus mediterraneus, *Bl. Schn.* p. 255.
—— bidens, *Bl. Schn.* p. 248.
Lutjanus brunnichii, *Lacép.* iv. p. 222; *Risso, Ichth. Nice,* p. 273.
—— massiliensis, *Lacép.* iv. p. 222 (not *Risso*).
—— mediterraneus, *Lacép.* iv. p. 226; *Risso, Ichth. Nice,* p. 272.
Crenilabrus boryanus, *Risso, Eur. Mérid.* iii. p. 320; *Cuv. & Val.* xiii. p. 189.
—— nigrescens, *Risso, l. c.* p. 320.
—— brünnichii, *Cuv. & Val.* xiii. p. 183.
—— mediterraneus, *Cuv. & Val.* xiii. p. 186; *Guichen. Explor. Algér. Poiss.* p. 86.
—— pictus, *Lowe, Trans. Zool. Soc.* ii. p. 186.

D. $\frac{16-17\,(18)}{9}$. A. $\frac{3}{9-11}$. L. lat. 34. L. transv. 4/12. Vert. 13/17.

The height of the body is contained thrice and a third to thrice and a half in the total length, the length of the head four times. Cheek with four series of small scales. The length of the snout is one-third of that of the head in young specimens, but longer in adult ones. A black spot at the base of the pectoral fin; sometimes a blackish spot superiorly at the base of the caudal; vertical fins with dots, which are blue during life.

Mediterranean. Madeira.

a. Adult. Madeira. From the Collection of the Zoological Society. —Type of *C. pictus*, Lowe.
b–c, *d*. Half-grown. Mediterranean. From the Haslar Collection.
e. Adult: skin. Mediterranean. From Mr. Yarrell's Collection.
f. Half-grown. Malta. From the Berlin Museum.
g. Half-grown.
h–k. Half-grown: stuffed.

3. **Crenilabrus melanocercus.**

Lutjanus melanocercus, *Risso, Ichth. Nice*, p. 283.
Crenilabrus melanocercus, *Risso, Eur. Mérid.* iii. p. 316; *Cuv. & Val.* xiii. p. 213.

$$D. \frac{17}{6\text{–}7}. \quad A. \frac{3}{9}.$$

The height of the body is one-fourth of the total length. Brownish; a curved bluish streak from the eye to beneath the lower jaw. Caudal fin dark-coloured towards the hind margin, with some blackish spots; pectoral pale, with a black spot on the extremity of the upper rays.

Western parts of the Mediterranean.

4. **Crenilabrus cæruleus.**

Risso, Eur. Mérid. iii. p. 316. pl. 10. fig. 25; *Cuv. & Val.* xiii. p. 214.

$$D. \frac{16}{7}. \quad A. \frac{3}{8}.$$

The height of the body is two-sevenths of the total length. Brownish, with an indistinct streak below the eye; caudal fin yellow at the base, and black on the posterior extremity, which has a yellow edge. Pectoral without black spot at its extremity.

Mediterranean.

5. **Crenilabrus melops.**

Berggylte, *Ström, Söndm.* p. 266. nos. 1 & 2.

LABRUS MELOPS, *L.*

Labrus melops, *L. Mus. Ad. Fred.* ii. p. 78, and *Syst. Nat.* i. p. 477; *Bl. Schn.* p. 261; *Lacép.* iii. p. 435; *Fries och Ekstr. Skand. Fisk.* p. 182. pl. 44.
—— turdus, *Müll. Prodr.* no. 383.
Lutjanus melops, *Risso, Ichth. Nice*, p. 265.
Crenilabrus melops, *Cuv. Règne Anim.*; *Risso, Eur. Mérid.* iii. p. 318; *Cuv. & Val.* xiii. p. 167; *Yarr. Brit. Fish.* 2nd edit. i. p. 325, 3rd

edit. i. p. 498; *Guichen. Explor. Algér. Poiss.* p. 85; *Nilss. Skand. Faun.* iv. p. 270.
Labrus tinca, *Turton, Brit. Faun.* p. 98; *Jen. Man.* p. 397.
Crenilabrus tinca, *Yarr. Brit. Fish.* 1st edit. i. p. 293; *Thomps. in Mag. Zool. & Bot.* ii. p. 442, and *Nat. Hist. Irel.* iv. p. 126; *Parn. Fish. Firth of Forth*, p. 99.

LABRUS RONE, *Ascan.*

Labrus rone, *Ascan. Ic.* tab. 14; *Lacép.* iii. p. 437; *Nilss. Prodr.* p. 77.
Crenilabrus rone, *Cuv. & Val.* xiii. p. 172.

THE GIBBOUS WRASSE, *Pennant* (monstros.)

Gibbous Wrasse, *Penn. Brit. Zool.* iii. p. 250. pl. 46; edit. 1812, p. 338. pl. 56, *cop. in Yarr. Brit. Fish.* 3rd edit. p. 503.
Labrus gibbus, *L. Gm.* i. p. 1295; *Bl. Schn.* p. 261; *Lacép.* iv. p. 219; *Turt. Brit. Faun.* p. 98; *Jen. Man.* p. 399.
Crenilabrus gibbus, *Flem. Brit. An.* p. 209; *Cuv. & Val.* xiii. p. 175; *Yarr. Brit. Fish.* 1st edit. i. p. 298.

GOLDSINNY, *Pennant.*

Goldsinny, *Penn. Brit. Zool.* iii. p. 220. pl. 47; edit. 1812, iii. p. 339. pl. 58.
Crenilabrus pennantii, *Cuv. & Val.* xiii. p. 178.

LUTJANUS NORWEGICUS, *Bloch.*

Lutjanus norwegicus, *Bl.* taf. 256; *Lacép.* iv. pp. 190, 232, 234.
Perca maculosa, *Retz. Faun. Suec.* p. 337.
Labrus norwegicus, *Bl. Schn.* p. 254; *Nilss. Prodr.* p. 76.
Crenilabrus norwegicus, *Cuv. & Val.* xiii. p. 176; *Yarr. Brit. Fish.* 2nd edit. i. p. 328.

LABRUS CORNUBIUS, *Donovan.*

? Labrus cornubicus, *L. Gm.* i. p. 1297; *Lacép.* iii. p. 389.
Labrus cornubius, *Donov. Brit. Fish.* iii. pl. 72; *Turt. Brit. Faun.* p. 99; *Jen. Man.* p. 398.
Crenilabrus cornubicus, *Yarr. Brit. Fish.* 3rd edit. i. p. 504; *Parn. Fish. Firth of Forth*, p. 102, and *Wern. Mem.* vii. p. 262.
—— donovani, *Cuv. & Val.* xiii. p. 180; *Guichen. Explor. Algér. Poiss.* p. 86.

CORKWING, *Couch.*

Corkwing, *Couch in Loud. Mag. Nat. Hist.* v. p. 17. fig. 4.
Crenilabrus couchii, *Cuv. & Val.* xiii. p. 178.

D. $\frac{(15)16}{9}$. A. $\frac{3}{10}$. L. lat. 35. L. transv. 4/12. Vert. 15/18.

The height of the body is contained thrice and a quarter to thrice and a half in the total length. Cheek with five or six series of small scales, the scaly part below the eye being much higher than the orbit. The length of the snout is one-third of that of the head. A black or deep-brown spot behind the orbit. The upper parts purplish, the lower greenish; sides of the head red, with vermiculated green bands edged with darker; body with violet longitudinal stripes, composed of spots which are intermixed with red ones on the lower parts; vertical and ventral fins green, the anal dark-green; pectoral reddish-yellow.

Coasts of Europe.

a. Adult: stuffed. Firth of Forth. From Dr. Parnell's Collection.
b, *c*–*h*. Half-grown and young. Brighton. Presented by J. G. Children, Esq.
i–*q*. Adult, half-grown, and young: skins and stuffed. Plymouth.
r. Young. South Devonshire. Mus. Leach.
s–*w*. Adult, half-grown, and young: skins. British coast. From Yarrell's Collection.
x. Young. British coast.
y. Fine specimen. Polperro. Presented by J. Couch, Esq.
z, *α*. Half-grown. South Wales. Presented by J. Stokes, Esq.
β. Young. Wales.
γ. Adult. Lisbon.—With a caudal spot.
δ. Adult. Mogador. Presented by the Rev. R. T. Lowe.—Without caudal spot. The colours are preserved, and nearly the same as in the specimen from Polperro.
ε–*ζ*. Half-grown. Mogador. Presented by the Rev. R. T. Lowe.—With a caudal spot.
η. Half-grown. Cadiz. From the Haslar Collection.
θ. Adult. Mediterranean.—This specimen has four irregular dark, cloudy cross-bands, indistinct on the back and the side, but very distinct on the dorsal fin; anal fin with two large dark blotches. (*C. donovani.*)
ι. Half-grown. Dalmatia.
κ, *λ*, *μ*. Adult: not good state.
ν–*ξ*. Adult: stuffed.
ο. Adult: skeleton. From the Haslar Collection.

6. **Crenilabrus quinquemaculatus.**

? Labrus, no. 76, *Brünn. Pisc. Mass.* p. 59.
? Labrus guttatus, *L. Gm.* i. p. 1296; *Lacép.* iii. p. 508.
Labrus quinquemaculatus, *Bl.* taf. 291. fig. 2; *Bl. Schn.* p. 250.
—— æruginosus, *Pall. Zoogr.* iii. p. 264; *Rathke, Fauna der Krym*, p. 340.
—— capistratus, *Pall. l. c.* p. 269.
Lutjanus roissali, *Risso, Ichth. Nice*, p. 276. pl. 8. fig. 28.
—— alberti, *Risso, l. c.* p. 277.
—— varius, *Risso, l. c.*
Crenilabrus roissali, *Risso, Eur. Mérid.* iii. p. 323; *Cuv. & Val.* xiii. p. 205.
—— tigrinus, *Risso, Eur. Mérid.* iii. p. 317.
—— capistratus, *Cuv. & Val.* xiii. p. 220; *Nordm. in Demid. Voy. Russ. Mérid.* p. 457.
—— æruginosus, *Nordm. l. c.* p. 456, *Poiss.* pl. 17. fig. 3; *Kessler, Bull. Soc. Nat. Mosc.* 1859, 2. p. 450.

D. $\frac{(14)\,15}{9}$. A. $\frac{3}{9}$. L. lat. 31. L. transv. $\frac{3\frac{1}{2}}{11}$. Vert. 14/18.

The height of the body is one-third or rather less than one-third of the total length. Cheek with four or three series of small scales, the scaly part below the eye being not much higher than the orbit; the length of the snout is one-third of that of the head. The soft dorsal fin with two black spots at the base. Back with five dark, indistinct cross-bands. Præorbital and operculum with a dark spot; a dark streak below the orbit descending obliquely forwards to the chin; body with some irregular dark spots; sometimes a dark spot on the middle of the base of the caudal fin.

Mediterranean. Black Sea.

a, b. Adult. Mediterranean. From the Haslar Collection.
c. Adult. Dalmatia.
d–e. Adult. Trieste. From the Berlin Museum.
f, g. Adult, half-grown, and young: many specimens. Malta.
h. Adult: stuffed. Malta.
i. Adult. Cannes. Presented by Th. Günther, M.D.
k–l. Adult. Alexandria. From the Berlin Museum.
m. Adult. Cadiz. From the Haslar Collection.
n. Adult. Lisbon.
o, p. Adult.

Variety: Dorsal fin with fourteen spines; the spots are of an intense black and rather numerous on the lower half of the body; præoperculum with three oblique black streaks.

q. Adult. Malta. From the Haslar Collection: has been in chloride of zinc.
r. Adult: skeleton.

Crenilabrus quinquemaculatus, Risso, Eur. Mérid. iii. p. 324, Cuv. & Val. xiii. p. 212, is another variety, with three other black spots on the base of the spinous dorsal fin, and two on the anal fin.

7. Crenilabrus griseus.

Labrus, no. 75, *Brünn. Pisc. Mass.* p. 58.
Labrus griseus, *L. Gm. Syst. Nat.* i. p. 1296.
—— cinereus, *Lacép.* iii. p. 487.
—— fuscus, *Pall. Zoogr. Ross.-As.* iii. p. 266; *Rathke, Fauna der Krym*, p. 340.
? Labrus frenatus, *Pall. Zoogr. Ross.-As.* iii. p. 270.
Lutjanus cinereus, *Risso, Ichth. Nice*, p. 266. pl. 8. fig. 26.
—— cottæ, *Risso, Ichth. Nice*, p. 282.
—— masse, *Risso, Ichth. Nice*, p. 274.
Crenilabrus massa, *Risso, Eur. Mérid.* iii. p. 326; *Cuv. & Val.* xiii. p. 202.
—— cottæ, *Risso, Eur. Mérid.* iii. p. 315; *Cuv. & Val.* xiii. p. 204.
—— frenatus, *Benn. Proc. Zool. Soc.* iii. p. 90.
? Crenilabrus frænatus, *Cuv. & Val.* xiii. p. 204; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 457.
Crenilabrus fuscus, *Cuv. & Val.* xiii. p. 219; *Nordm. l. c.* p. 455; *Kessler, Bull. Soc. Nat. Mosc.* 1859, 2. p. 446.
—— pusillus, *Nordm. l. c.* p. 454, *Poiss.* pl. 18. fig. 2.

D. $\frac{(13)\,14}{9\text{–}10}$. A. $\frac{3}{9}$. L. lat. 32. L. transv. 3/9. Vert. 14/17.

The height of the body is two-sevenths of the total length. Cheek with two series of scales, the scaly part below the eye being equal in height to the orbit. The length of the snout is one-third of that of the head. A black spot anteriorly on the spinous dorsal; a black spot which is frequently absent on the lower part of the base of the caudal fin; a brown band runs from above the orbit, along the lateral line, to the back of the tail; another from the lower half of the orbit towards the black caudal spot; the interspace between the two bands is of a light colour; a brown streak round the lower part of the orbit and across the chin; sides of the body and vertical fins with brown dots.

Mediterranean. Black Sea.

a. Adult. Trebizond. From the Collection of the Zoological Society.—Type of *C. frenatus*, Benn.
b–c, d–e. Adult and half-grown. Dalmatia.
f. Adult. Trieste. From the Berlin Museum.
g, h. Adult. Cadiz. From the Haslar Museum.
i. Adult: skeleton. Cadiz. From the Haslar Museum.

8. **Crenilabrus staitii.**

? Labrus simus, *Pall. Zoogr.* iii. p. 271.
Crenilabrus staitii, *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 452. pl. 18. fig. 1.

D. $\frac{14}{10}$. A. $\frac{3}{9}$.

The height of the body is two-sevenths of the total length. Greenish-olive, variegated with brown and whitish; a brown streak from the eye to the upper lip, and another to the lower jaw; body with two brown longitudinal bands; two dark spots at the root of the caudal, the lower of which is the larger and edged with black; vertical and ventral fins with small spots; dorsal without black spot anteriorly. (*Nordm.*)

Odessa.

Kessler considers this fish to be a variety of *C. fuscus*, Pall., or *C. griseus*, Gm.

9. **Crenilabrus baillonii.**

Crenilabrus baillonii, *Cuv. & Val.* xiii. p. 191. pl. 373; *Cuv. Règne Anim. Ill. Poiss.* pl. 87. fig. 3.

D. $\frac{14}{10}$. A. $\frac{3}{10}$. L. lat. 35. L. transv. $\frac{4\frac{1}{2}}{11}$.

The height of the body is contained three times and a third or three times and a half in the total length. Cheek with two or three series of scales; the length of the snout is one-third of that of the head. The soft dorsal and the anal with two black or blackish spots at the base. Back with five or six dark cross-bars, more distinct in young individuals. Operculum without dark spot; base of the pectoral black.

Coasts of Lisbon and Mogador; British Channel.

a–b. Fine specimens. Lisbon. Presented by the Rev. R. T. Lowe.
c–h. Fine specimens. Mogador. Presented by the Rev. R. T. Lowe.

This species may be easily distinguished from its nearest ally, *C. quinquemaculatus*, by the larger scales on the cheek, and by the greater number of longitudinal series of scales above the lateral line. The characters by which the two species have been distinguished are constant in all the specimens examined; the anterior spot on the dorsal fin is the most distinct, whilst the others are paler and may entirely disappear with age. The number of the anal rays has been incorrectly given by Valenciennes.

10. Crenilabrus ocellatus.

Labrus ocellatus, *Forsk. Faun. Arab.* p. 37; *Bl. Schn.* p. 259.
Labrus, no. 71, *Brünn. Pisc. Mass.* p. 56.
——, no. 74, *Brünn. l. c.* p. 58.
—— olivaceus, *L. Gm.* i. p. 1295; *Bl. Schn.* p. 254.
—— venosus, *L. Gm.* i. p. 1296; *Bl. Schn.* p. 255.
Lutjanus ocellatus, *Lacép.* iv. p. 218.
—— olivaceus, *Lacép.* iv. p. 218.
Labrus reticulatus, *Lacép.* iii. p. 508.
—— perspicillatus, *Pall. Faun. Ross.-As.* iii. p. 267; *Rathke, Fauna der Krym*, p. 341.
Crenilabrus ocellatus, *Cuv. & Val.* xiii. p. 193; *Guichen. Explor. Algér. Poiss.* p. 87; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 458; *Kessler, Bull. Soc. Nat. Mosc.* 1859, 2. p. 449.
? Crenilabrus littoralis, *Risso, Eur. Mérid.* iii. p. 322; *Cuv. & Val.* xiii. p. 198.
Crenilabrus perspicillatus, *Nordm. l. c. Poiss.* pl. 17. figs. 1 & 2.
—— argenteo-striatus, *Nordm. l. c.* p. 461. pl. 18. fig. 4 (young).

D. $\frac{(13)\ 14\text{–}15}{10\text{–}9}$. A. $\frac{3}{9}$. L. lat. 33. L. transv. 3/10.

The height of the body is contained three times and two-thirds in the total length, and is equal to the length of the head. Cheek with three series of scales, the scaly part below the orbit being rather higher than the eye; the length of the snout is one-third of that of the head. Operculum with a deep-black spot, frequently edged with white; sometimes a small spot on the middle of the root of the caudal fin.

Mediterranean.

a, b, c. Adult. Dalmatia.
d, e, f. A great number of specimens of different ages, from Malta.
g. Half-grown.
h. Half-grown: skin. From Mr. Yarrell's Collection.

11. Crenilabrus morelli.

Crenilabrus morelli, *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 459. pl. 18. fig. 3.

D. $\frac{13}{9}$. A. $\frac{3}{9}$.

The height of the body is contained three times and two-thirds in the total length, and equal to the length of the head. Red, with two obsolete brownish longitudinal bands; a black spot on the operculum, and another on the middle of the root of the caudal fin. Three large brownish blotches along the base of the dorsal fin, three others along that of the anal, and a similar one on the basal half of the ventral. (*Nordm.*)

Sebastopol.

Probably only a variety of *C. ocellatus.*

12. Crenilabrus rostratus.

Lutjanus rostratus, *Bloch*, taf. 254. fig. 2.
—— rubescens, *Risso, Ichth. Nice*, p. 271.
—— virescens, *Risso, l. c.* p. 280.
—— lamarckii, *Risso, l. c.* p. 281. pl. 9. fig. 29.
Coricus rostratus, *Cuv. & Val.* xiii. p. 256. pl. 376; *Cuv. Règne Anim. Ill. Poiss.* pl. 88. fig. 1; *Guichen. Explor. Algér. Poiss.* p. 89; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 463, *Poiss.* pl. 20. fig. 2.
—— lamarckii, *Risso, Eur. Mérid.* iii. p. 332.
—— rubescens, *Risso, l. c.* p. 333.
—— virescens, *Risso, l. c.* p. 332; *Bonap. Faun. Ital. Pesce,* pl. fig. 4.
—— brama, *Nordm. l. c.* p. 464. pl. 20. fig. 1.

D. $\frac{(14, 15 (16)}{10}$. A. $\frac{3}{9-10}$. L. lat. 30. L. transv. 3/11. Vert. 13/18.

A black spot anteriorly on the dorsal fin; head, body and spinous dorsal with brown dots.

Mediterranean.

a. Fine specimen. Dalmatia.
b–c, d. Adult and half-grown. Trieste. From the Berlin Museum.
e. Adult. Malta. From the Haslar Collection.
f, g–i. Adult and half-grown. Cannes. Presented by Th. Günther, M.D.
k–l. Adult: bad state. Old Collection.
m–n. Adult: stuffed: bad state.

13. Crenilabrus tinca.

Labrus tinca, *Brünn. Pisc. Mass.* no. 70; *Bl. Schn.* p. 256.
Lutjanus tinca, *Risso, Ichth. Nice*, p. 270.
Crenilabrus tinca, *Risso, Eur. Mérid.* iii. p. 315; *Cuv. & Val.* xiii. p. 199; *Guichen. Explor. Algér. Poiss.* p. 87.

D. $\frac{15}{10}$. A. $\frac{3}{9}$. L. lat. 35. L. transv. 3/11.

The height of the body equals the length of the head, and is contained thrice and three-fourths in the total. Cheek with three series of small scales, the scaly part below the eye being as high as the orbit; the length of the snout is rather more than one-third of that of the head. A broad (in spirits, brown) band runs from the snout through the eye to the upper portion of the base of the caudal; it is bordered by a silvery band above and below, the lower of these silvery bands proceding from the angle of the mouth to the lower half of the base of the caudal; the black caudal spot is small and situated above the lateral line, if present. Vent black; no black spot on the dorsal fin.

Mediterranean.

a. Adult. Old Collection.
b, *c*. Half-grown. Dalmatia.

3. LACHNOLAIMUS.

Lachnolaimus, *Cuv. & Val.* xiii. p. 274.

Body compressed, somewhat elevated, covered with scales of moderate size; snout pointed; imbricate scales on the cheeks and opercles. Lateral line not interrupted. Teeth in the jaws conical, in a single series; no posterior canine tooth. Dorsal spines numerous (14), the anterior of which are much produced; outer caudal rays more or less prolonged; anal spines three.

Caribbean Sea.

1. Lachnolaimus falcatus.

Suillus, *Catesby, Hist. Carol.* ii. pl. 15.
Perro, *Parra,* lam. 3. fig. 2.
Labrus falcatus, *L. Syst. Nat.* i. p. 475; *Lacép.* iii. pp. 425, 463.
Lachnolaimus aigula, *Cuv. & Val.* xiii. p. 277. pl. 378.
—— dux, *Cuv. & Val.* xiii. p. 285.
—— caninus, *Cuv. & Val.* xiii. p. 288.
—— psittacus, *Cuv. & Val.* xiii. p. 291.
? Lachnolaimus suillus, *Cuv. & Val.* xiii. p. 286; *Cuv. Règne Anim. Ill. Poiss.* pl. 86. fig. 3.

D. $\frac{14}{11}$. A. $\frac{3}{10}$. L. lat. 41. L. transv. 8/19. Vert. 12/17.

The height of the body is two-fifths of the total length (the caudal fin not included); anterior dorsal spines and caudal lobes produced into more or less long filaments. Generally a black spot on the base of the posterior dorsal rays.

Caribbean Sea.

a. Adult. Cuba. From the Collection of the Zoological Society.
b–e. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
f. Fine specimen. Puerto Cabello. Purchased of Mr. Brandt.
g. Fine specimen. Caribbean Sea. Presented by Sir J. Richardson.
h. Half-grown: stuffed. Mexico. Presented by Dr. J. E. Gray.
i. Half-grown: skin. West Indies.
k. Half-grown. From the Haslar Collection.

4. TAUTOGA*.

Tautoga, *Mitch. Report Fish. New York,* 1814, p. 23.
Tautoga, sp., *Cuv. & Val.* xiii. p. 292.

Body compressed, oblong, covered with small scales; scales on the cheek rudimentary, few in number, opercles naked. Teeth in the jaws conical, in double series; no posterior canine tooth. Dorsal spines numerous (17), anal spines three. Lateral line not interrupted.

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* 1. Labrus tessellatus, *Bl.* taf. 291. fig. 1; *Bl. Schn.* p. 251.—Tautoga tessellata, *Cuv. & Val.* xiii. p. 315.—Norway.

Temperate parts of the north-western Atlantic

1. Tautoga onitis.

Labrus onitis, *L. Syst. Nat.* i. p. 478; *L. Gm.* i. p. 1290; *Bl. Schn.* p. 260; *Lacép.* iii. p. 501.
Black-fish, *Schoepf in Schrift. Gesellsch. Naturf. Freunde,* viii. p. 156.
Labrus americanus, *Bl. Schn.* p. 261; *Storer, Syn.* p. 137.
Tautoga nigra, T. fusca, T. rubens, T. alia, T. cœrulea, *Mitch. Report Fish. New York,* 1814, p. 23.
Labrus tautoga, *Mitch. in Lit. & Phil. Trans. New York,* i. p. 398. pl. 3. f. 1.
Tautoga nigra, *Cuv. & Val.* xiii. p. 293; *Dekay, New York Fauna, Fishes,* p. 175. pl. 14. fig. 39.

B. 5. D. $\frac{17}{10}$. A. $\frac{3}{8}$. L. lat. 60. L. transv. 16/35. Vert. 16/18.

Nearly uniform brownish or blackish.

Atlantic coasts of the Northern States of North America.

a. Fine specimen. Boston. Presented by B. Winstone, Esq.
b. Half-grown. New York.
c–d. Young. Beesley's Point. Presented by the Smithsonian Institution.
e. Adult. North America. Purchased of Mr. Warwick.
f. Half-grown. Old Collection.
g. Half-grown: skin.

5. MALACOPTERUS.

Malapterus, *Cuv. & Val.* xiii. p. 355.

Body compressed, oblong, covered with scales of moderate size; imbricate scales on the cheek; operculum with a series of scales along the lower margin, the rest of the opercular apparatus being naked. Teeth in the jaws conical, in a single series; no posterior canine tooth. Dorsal spines numerous (18); anal rather long, with three spines; the spines are feeble and flexible. Lateral line not interrupted.

Coast of Chile.

1. Malacopterus reticulatus.

Cuv. & Val. xiii. p. 355. pl. 383 (not good); *Gay, Hist. Chil. Zool.* ii. p. 301.

D. $\frac{18}{14}$. A. $\frac{3}{18}$. L. lat. 37. L. transv. 3/11.

The height of the body is one-fifth of the total length. Brownish.

Island of Juan Fernandez.

6. CTENOLABRUS*.

Ctenolabrus, *Cuv. & Val.* xiii. p. 223.

Body compressed, oblong, covered with scales of moderate size;

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* 1. Labrus cinereus, *Pall. Faun. Ross.-As.* iii. p. 267.—Ctenolabrus cinereus, *Cuv. & Val.* xiii. p. 234.—Black Sea.
2. Ctenolabrus acutus, *Cuv. & Val.* xiii. p. 235.—Mediterranean.

imbricate scales on the cheeks and opercles. Teeth in the jaws in a band, with an outer series of stronger conical teeth; no posterior canine tooth. Dorsal spines numerous, 16–18; anal spines three. Lateral line not interrupted.

Mediterranean, and temperate parts of the North Atlantic.

Synopsis of the Species.

* Interoperculum scaly. European: *Ctenolabrus*, p. 89.

** Interoperculum naked. American: *Tautogolabrus*, p. 90.

* Interoperculum scaly: *Ctenolabrus*.

1. Ctenolabrus rupestris.

Jago's Goldsinny, *Ray, Syn. Pisc.* p. 163. tab. 1. fig. 3; *Yarr. Brit. Fish.* i. p. 301, 2nd edit. i. p. 333.
Sciæna rupestris, *L. Mus. Ad. Fred.* p. 65. tab. 31. fig. 7.
Karudse, *Ström, Söndm.* i. p. 291.
Pontoppidan, Nat. Hist. Norway, ii. p. 226.
Bergnultra, *Linn. Westg. Resa,* p. 179.
Labrus suillus, *L. Faun. Suec.* p. 117, and *Syst. Nat.* i. p. 476.
—— rupestris, *L. Syst. Nat.* i. p. 478; *Walb. Artedi,* iii. p. 252; *Müll. Prodr. Zool. Dan.* p. 45; *Bl. Schn.* p. 248; *Nilss. Prodr.* p. 76; *Fries & Ekstr. Skand. Fisk.* p. 45. tab. 9. fig. 1.
Perca rupestris, *Müll. Zool. Dan.* iii. p. 44. tab. 107; *Retz. Faun. Suec.* p. 337.
Lutjanus rupestris, *Bl.* taf. 250. fig. 1.
Sparus carudse, *Lacép.* iv. p. 148.
Crenilabrus rupestris, *Selby, Mag. Zool. & Bot.* i. p. 167; *Thomps. ibid.* ii. p. 445, and *Zool. Prod.* p. 57; *Parn. Wern. Mem.* vii. p. 264, and *Fish. Firth of Forth,* p. 104.
Ctenolabrus rupestris, *Cuv. & Val.* xiii. p. 223; *Yarr. Brit. Fish.* 3rd edit. i. p. 509; *Guichen. Explor. Algér. Poiss.* p. 88.

B. 5. D. $\frac{16\text{–}17\,(18)}{10\text{–}9\,(8)}$. A. $\frac{3}{7\text{–}8}$. L. lat. 38–40. L. transv. 3/12. Vert. 15/18.

The height of the body is two-sevenths of the total length; five series of scales on the præoperculum. A large black spot anteriorly on the dorsal fin, another superiorly on the base of the caudal.

Coasts of Europe.

a. Fine specimen. Lyme Regis. Presented by the Earl of Enniskillen.
b. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
c. Adult. Mediterranean. Presented by Dr. Rüppell.
d. Adult: skin. From Mr. Yarrell's Collection.
e. Adult: stuffed.

2. Ctenolabrus marginatus.

Cuv. & Val. xiii. p. 232.

D. $\frac{17}{9}$. A. $\frac{3}{7}$.

The height of the body is contained four times and two-thirds in the total length. A large black spot anteriorly on the dorsal fin, and another on each side of the caudal; vertical fins with a narrow blackish margin. (*Val.*)

Mediterranean.

3. **Ctenolabrus iris.**

Cuv. & Val. xiii. p. 236. pl. 374; *Lowe, Trans. Zool. Soc.* iii. p. 11; *Bonap. Faun. Ital. Pesc.* pl. fig. 3.

D. $\frac{16}{11}$. A. $\frac{3}{10}$. L. lat. 37. L. transv. 3/10.

The height of the body is one-fifth of the total length; snout conically produced; head twice as long as high. A brown longitudinal streak through the eye and across the operculum. A black spot on the anterior soft dorsal rays, and a second round one on the posterior part of the two middle caudal rays.

Mediterranean. Madeira.

a. Sicily. Presented by W. Swainson, Esq.

** Interoperculum naked: *Tautogolabrus.*

4. **Ctenolabrus burgall.**

Labrus burgall, *Schoepf in Schrift. Gesellsch. Naturf. Freunde,* viii. p. 155; *Bl. Schn.* p. 251.

—— chogset, *Mitch. in Trans. Lit. & Phil. Soc. New York,* i. p. 402. pl. 3. fig. 2.

Ctenolabrus chogset, *Cuv. & Val.* xiii. p. 237.

—— cœruleus, *Storer, Synops. Fish. N. A.* p. 134; *Dekay, New York Fauna, Fishes,* p. 172. pl. 29. fig. 93.

D. $\frac{18(19)}{10}$. A. $\frac{3}{9}$. L. lat. 46–50. L. transv. 6/17. Vert. 17/19.

The height of the body is equal to, or rather more than, the length of the head, and is contained three times and one-third or three times and two-thirds in the total; five or six series of small scales on the cheek. Greenish or bluish, sometimes faintly clouded; head and back with yellow dots.

Atlantic coasts of the northern parts of North America.

a. Adult. Canada. Presented by the Officers of the Army Medical Department at Fort Pitt.
b. Half-grown: skin. New York.
c. Fine specimen. Boston. Presented by B. Winstone, Esq.
d. Adult. Nahans Bay. Presented by B. Winstone, Esq.
e, f, g, h, i–m. Adult and half-grown. North America.
n. Adult female: skeleton. Boston. Presented by B. Winstone, Esq.

Variety.

Ctenolabrus uninotatus, *Cuv. & Val.* xiii. p. 239; *Dekay, New York Fauna, Fishes,* p. 174. pl. 29. fig. 90.

A black spot on the base of the two anterior soft dorsal rays.

a. Fine specimen. Halifax Harbour. Presented by B. Winstone, Esq.
b. Young. Presented by the Smithsonian Institution.

The stomach passes gradually into the intestine; the mucous membrane of both is laid in numerous reticulated folds; a small circular valve separates the lower fourth of the intestine from the upper portion. The intestine is short, and makes only one complete circumvolution. Air-bladder large, simple, firmly attached to the sides of the abdomen.

Skeleton.—The longitudinal axis of the maxillary is straight, and not curved as in *Labrus* and *Crenilabrus*; occipital crest very low. The lower pharyngeal bone has a straight posterior margin, and is armed with conical teeth, the posterior being the largest. The abdominal portion of the vertebral column is scarcely shorter than the caudal.

7. ACANTHOLABRUS *.

Acantholabrus, sp., *Cuv. & Val.* xiii. p. 242.

Body moderately compressed, oblong, covered with scales of moderate size; imbricate scales on the cheeks and opercles. Teeth in the jaws in a band, those of the outer series conical, strong; no posterior canine tooth. Dorsal spines numerous, 20–21; anal spines more than three. Lateral line not interrupted.

Mediterranean; western coasts of Europe.

The description of the teeth given by Valenciennes agrees only with a portion of the species; the others have the single series of teeth of the true *Labri*.

1. Acantholabrus palloni.

Lutjanus palloni, *Risso, Ichth. Nice,* p. 263.
Crenilabrus exoletus, *Risso, Eur. Mérid.* iii. p. 319.
Acantholabrus palloni, *Cuv. & Val.* xiii. p. 243. pl. 375.
Crenilabrus luscus, *Lowe in Trans. Zool. Soc.* ii. p. 187 (not *L.*).
Acantholabrus imbricatus, *Lowe in Proc. Zool. Soc.* 1839, p. 86, & 1843, p. 87, and *Trans. Zool. Soc.* iii. p. 10.

D. $\frac{20}{9}$. A. $\frac{5}{8}$. L. lat. 45. L. transv. 4/16. Vert. 18/18.

The height of the body is less than one-fourth of the total length. A black spot on the back of the tail, at the base of the caudal fin; another on the last dorsal spines (sometimes absent).

Mediterranean; Madeira; coast of Cornwall.

a. Adult: stuffed. Cornwall. From Mr. Couch's Collection as *A. couchii* (anal spines five).

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* 1. Labrus vetula, *Yarr. Brit. Fish.* 1st edit. i. p. 284; *Jen. Man.* p. 395 (not *Bl.*).—Acantholabrus yarrellii, *Cuv. & Val.* xiii. p. 250; *Yarr. Brit. Fish.* 2nd edit. i. p. 339, 3rd edit. i. p. 516.—Nilsson (*Skand. Faun.* iv. p. 278) has suggested that Yarrell examined an abnormal specimen of *Labrus mixtus*, in which three of the soft rays were transformed into spines. I fully concur with this opinion, and would further remark, that this typical specimen does not appear to have been preserved.

b. Adult: stuffed. Madeira. From Mr. Lowe's Collection. (Type of *A. imbricatus*, Lowe.)
c–e. Very fine specimens. Madeira. Presented by J. Y. Johnson, Esq.
f. Adult: skeleton Madeira. Presented by the Rev. R. T. Lowe.

The abdominal portion of the vertebral column, in this species, exceeds in length the caudal.

2. Acantholabrus couchii.

Labrus luscus, *Couch in Loud. Mag. Nat. Hist.* v. pp. 18, 742. fig. 121; *Jen. Man.* p. 400; *Yarr. Brit. Fish* edit. 1. i. p. 300 (not *L.*).
Acantholabrus couchii, *Cuv. & Val.* xiii. p. 248; *Yarr. Brit. Fish.* edit. 2. i. p. 337, and edit. 3. i. p. 514.

$$D. \frac{21}{8}. \quad A. \frac{6}{8}.$$

The height of the body is less than one-fourth of the total length. A black spot on the back of the tail, at the base of the caudal fin.

Coast of Cornwall.

Only one specimen, from which Mr. Couch has given his description, has occurred, and it was not preserved. All the other accounts of the fish are reproductions of Mr. Couch's original description. Considering the frequent cases of variation in the number of the spines of the genera *Labrus* and *Acantholabrus*, we cannot help thinking that the specimen observed was an individual variety.

8. CENTROLABRUS.

Acantholabrus, sp., *Cuv. & Val.*

Body compressed, oblong, covered with scales of moderate size; imbricate scales on the cheeks and opercles. Teeth in the jaws in a single series, conical; no posterior canine tooth. Dorsal spines numerous, 16–20; anal spines more than three. Lateral line not interrupted.

Atlantic coasts of Europe and Greenland.

1. Centrolabrus exoletus.

Ström, Söndm. i. p. 267. no. 3.
Labrus exoletus, *L. Syst.* i. p. 479, and *Faun. Suec.* p. 117; *Müll. Prodr. Zool. Dan.* p. 46; *Fabr. Faun. Grönl.* p. 166; *Retz. Faun. Suec.* p. 335; *Bl. Schn.* p. 260; *Nilss. Prodr.* p. 77; *Fries och Ekstr. Skand. Fisk.* p. 48. tab. 9. fig. 2.
—— pentacanthus, *Lacép.* iii. p. 503.
Crenilabrus microstoma, *Thomps. Proc. Zool. Soc.* 1837, p. 55, and *Mag. Zool. & Bot.* ii. p. 446. pl. 14, and *Nat. Hist. Irel.* iv. p. 132.
Rock-Cook, *Couch, Corn. Faun.* p. 39.

Acantholabrus exoletus, *Cuv. & Val.* xiii. p. 247; *Yarr. Brit. Fish.* edit. 2. i. p. 341, edit. 3. i. p. 518.
—— microstoma, *Cuv. & Val.* xiii. p. 250.

$$\text{D. } \frac{18\text{–}19\ (20)}{6}. \quad \text{A. } \frac{5}{7}. \quad \text{L. lat. 33–35.}$$

The height of the body is two-sevenths of the total length. Light reddish-brown; no black spot behind the orbit.

Coasts of northern Europe to the coasts of Greenland.

a. Stuffed. Cawsand. Presented by Lieut. H. F. Spence, R.N.
b–c. Young. From the Mus. Leach.

2. Centrolabrus trutta.

Crenilabrus trutta, *Lowe, Proc. Zool. Soc.* i. 1833, p. 143.
Acantholabrus viridis, pt., *Cuv. & Val.* xiii. p. 252.
—— viridis, *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 64. pl. 17. fig. 14.
? Acantholabrus romerus, *Valenc. l. c.*

$$\text{D. } \frac{17}{8}. \quad \text{A. } \frac{5}{8}. \quad \text{L. lat. 34.} \quad \text{L. transv. } \frac{3\frac{1}{2}}{11}.$$

The height of the body is two-sevenths of the total length. Back with interrupted brown cross-bars; a dark spot behind the orbit, as in *Crenilabrus melops*. Sometimes a spot on the root of the caudal fin.

Madeira. Canary Islands.

a, b, c. Adult and half-grown. Madeira. Presented by J. Y. Johnson, Esq.

3. Centrolabrus romeritus.

Acantholabrus viridis, pt., *Cuv. & Val.* xiii. p. 252.
—— romeritus, *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 64.

$$\text{D. } \frac{16}{9}. \quad \text{A. } \frac{4}{9}.$$

The height of the body is two-sevenths of the total length. Brownish-green, sometimes with indistinct darker longitudinal streaks.

Canary Islands.

Probably identical with *C. trutta*.

Second Group. CHŒROPINA.

9. CHŒROPS.

Cossyphus, sp., *Cuv. & Val., Bleek.*
Chœrops, *Rüpp. Verz. Mus. Senckenb. Fische*, p. 20; *Bleek. Proc. Zool. Soc.* 1861, p. 416.
Hypsigenys, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 383.

Body compressed, oblong, covered with rather large scales; snout obtuse; cheeks high, with very small scales which are generally not imbricate; operculum scaly. Each jaw anteriorly with four strong canine teeth, the lateral teeth being more or less confluent into an obtuse osseous ridge. Formula of the fins: D. $\frac{13}{7}$. A. $\frac{3}{9\,(10)}$. Lateral line not interrupted.

Indian and Australian Seas.

1. Chœrops macrodon.

Labrus macrodontus, *Lacép.* iii. pp. 451, 522; *Cuv. & Val.* xiii. p. 98.
Chœrops meleagris, *Rüpp. l. c.*
Cossyphus macrodon, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 10.
? Labrus chlorodus, *Gronov. Syst. ed. Gray*, p. 80.

D. $\frac{13}{7}$. A. $\frac{3}{9}$. L. lat. 32.

A posterior canine tooth. Serrature of the præoperculum minute in young specimens, and lost with age. Head obtuse, with the forehead elevated, its length being two-sevenths of the total. Scales on the cheek subimbricated. Ground-colour of the head and of the back darker than of the posterior and inferior parts and dotted with red; a more or less distinct white blotch below the lateral line, covered by the hinder third of the pectoral. Dorsal fin blue, with orange-coloured spots along the base and with two bands of the same colour along the middle; anal blue, reticulated with orange; caudal greenish. Pectoral yellow, dark-blue at the base.

East Indian Archipelago. North coast of Australia.

a. Eight inches long.
b. Eleven inches long: stuffed. Hope Islands (N.E. coast of Australia). Purchased of Mr. Cuming.

2. Chœrops ommopterus.

? Cossyphus schönleinii, (*Agass.*) *Cuv. & Val.* xiii. p. 143.
Cossyphus ommopterus, *Richards. Ichth. Chin.* p. 257.
—— schönleinii, *Bleek. Celebes*, v. p. 252.

D. $\frac{13}{7}$. A. $\frac{3}{10}$. L. lat. 29. L. transv. 4/12.

Posterior canine tooth absent. Serrature of the præoperculum very distinct. Head obtuse, as high as long; præorbital very high; scales on the cheek not imbricate. Green, each scale with a blue spot in the centre; an oblique blue band from the angle of the mouth to the interoperculum; a blue streak round the gill-opening; dorsal fin with a series of blue spots along the middle and with a round black spot *on and before* the last spine; anal fin with a blue streak along the base, two series of blue spots, and with a purple margin; corners of the caudal fin purplish.

Coasts of China and Australia. Molucca Sea.

a. Fourteen inches long: stuffed. Canton. Presented by J. R. Reeves, Esq.—Type of the species.
b. Half-grown: stuffed. China. Presented by J. R. Reeves, Esq.
c. Half-grown. Molucca Sea.

d. Half-grown. From Mr. Brandt's Collection.
e. Half-grown: stuffed. Cape York, in 63 fathoms, with hook and line. Voyage of the 'Rattlesnake.'

Sir John Richardson has evidently confounded the measurements of the typical specimens of this and other allied species. A specimen 6½ inches in length does not exist in the British Museum Collection.

Cossyphus cyanostolus, Richards. Ichthyol. Chin. p. 256, is founded on a mounted specimen, on two others in spirits, and, finally, on a drawing of Mr. Reeves. The mounted specimen has evidently served as the type not only of *C. cyanostolus*, but also of a second species (*C. ommopterus*), to which it properly belongs. Secondly, the two specimens in spirits belong to a very different species, which is distinguished by a large pearl-coloured spot on the side of the body (*Ch. oligacanthus*). Thus the species rests entirely on Mr. Reeves's drawing, which is described by Sir J. Richardson; that drawing shows only twelve dorsal spines.

3. Chœrops leucozona.

Crenilabrus leucozona, *Bleek. Biliton*, iv. p. 238.

D. $\frac{13}{7}$. A. $\frac{3}{9}$. L. lat. 25–26.

Posterior canine tooth?

Serrature of the præoperculum very distinct. Head obtuse. Violet-olive, with five whitish cross-bands, the first below the eye, the second behind the axil, the fifth on the tail. Dorsal fin with a blackish spot between the two first dorsal spines, with another between the two last, and with several other violet-olive spots; base of the pectoral with a large double brownish-violet and whitish spot. (*Bl.*)

Biliton.

The single specimen observed is 44 mm. long, and is probably the immature state of some other known species, perhaps of *Chœrops ommopterus*.

4. Chœrops anchorago.

Sparus anchorago, *Bl.* v. p. 108. taf. 276; *Bl. Schn.* p. 276.
Cossyphus anchorago, *Trosch. in Wiegm. Arch.* 1840, p. 279.

D. $\frac{13}{7}$. A. $\frac{3}{9}$. L. lat. 30.

A posterior canine tooth, absent in young specimens. Præoperculum serrated. Head nearly as high as long. Scales on the præoperculum small, numerous, imbricate. Body with four dark, broad cross-bands, the middle of which are sometimes confluent; a white cross-band on the back of the tail, behind the dorsal; sides of the head with yellow (in life red?) dots; base of the pectoral brown; dorsal with two dark longitudinal lines; the other fins yellowish.

Amboyna.

a. Young. Amboyna. Purchased of Mr. Frank.

5. Chœrops japonicus.

Labrus japonicus, *Cuv. & Val.* xiii. p. 99; *Schleg. Faun. Japon. Poiss.* p. 163. pl. 85.
Cossyphus japonicus, *Bleek. Verhand. Batav. Genootsch.* xxv. *Nalez. Jap.* p. 16, and xxvi. *Nalez. Jap.* p. 114.

D. $\frac{13}{7}$. A. $\frac{3}{9}$. L. lat. 28–29. L. transv. 3½/10.

A posterior canine tooth. Præoperculum minutely serrated. Head obtuse, as high as long, with the upper profile convex, its length being contained thrice and three-fifths in the total. The teeth in both jaws are confluent into an osseous ridge. Red: a brownish violet band from the sixth, seventh and eighth dorsal spines to the axil, each scale with a blue streak or spot; a short violet streak from the eye to the snout. Dorsal and anal fins yellow, the former with a reddish-violet band along the base, the latter with a similar one of rose-colour; caudal with dark upper and lower margins; base of the pectoral yellow.

Seas of Japan and China.

a–b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—The dark cross-band sometimes disappears in stuffed specimens.
c. Adult: stuffed. China. Purchased of Mr. Warwick.
d. Adult. From Dr. P. v. Bleeker's Collection.

6. Chœrops oligacanthus.

Crenilabrus oligacanthus, *Bleek. Riouw*, p. 489, and *Singapore*, p. 68.

D. $\frac{13}{7}$. A. $\frac{3}{10}$. L. lat. 29. L. transv. 3/11.

A posterior canine tooth, absent in young specimens. Serrature of the præoperculum very distinct. Head nearly as high as long; præorbital elevated; scales of the præoperculum small, numerous, imbricate; the inner canine teeth of the upper jaw are the strongest. Greenish: an oblong white blotch, with a brown one below, between the pectoral and the sixth and eighth dorsal spines; sometimes another brown spot on each side of the tail, behind the dorsal fin; red and blue streaks from the eye to the maxillary and to the operculum; dorsal and anal fins bluish, with red spots; caudal red, with blue dots; the anal fin of immature specimens shows oblique white lines.

East Indian Archipelago.

a. Singapore.
b–c. From the Haslar Collection.

7. Chœrops cyanodon.

Labrus cyanodus, *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 355.
Lachnolaimus cyanodus, *Richards. Voy. Ereb. & Terr. Fishes*, p. 131. pl. 55. figs. 5–7.

D. $\frac{13}{7}$. A. $\frac{3}{10}$. L. lat. 30. L. transv. 3/10.

Posterior canine tooth absent. Serrature of the præoperculum none. Head obtuse, as high as long; præorbital very high; scales on the cheek not imbricate. Back crossed by three or four dark bands separated by shining silvery interspaces; dorsal and anal fins with yellow longitudinal lines; caudal greyish, with small round transparent spots and with an intramarginal line; pectoral with a blackish upper margin. Cheeks with irregular bluish lines. The dark cross-bands are sometimes indistinct.

Coasts of Australia.

a. Twenty-six inches long: stuffed. Harvey River, West Australia. (Freshwater.) Purchased of Mr. Gould.
b. Twenty-six inches long: stuffed. Houtmans Abrolhos. Purchased of Mr. Gould.
c. One foot long: stuffed. Port Essington. Presented by the Earl of Derby.
d. Adult: skin. Port Essington. From Mr. Gilbert's Collection.—Type of the species.
e. Half-grown: stuffed. Victoria. From the Voyage of H.M.S. Herald.
f. Half-grown: skin. Bramble Island, Endeavour Straits.
g. Adult: stuffed. Cape York, in 62 fathoms, with hook and line. Voyage of the 'Rattlesnake.'

8. **Chœrops rubescens.**

D. $\frac{13}{7}$. A. $\frac{3}{10}$. L. lat. 30. L. transv. 4/12.

No posterior canine tooth. Serrature of the præoperculum very distinct. Uniform reddish.

West coast of Australia.

a. Skin. Houtmans Abrolhos. 'Rockfish' of the Colonists.

Description.—The form is the same as in all the fishes of this generic group. The height of the body is contained thrice and two-fifths in the total length, the length of the head thrice and three-fifths. The head is obtuse, nearly as high as long; præorbital very high; scales on the cheek small, not imbricate; eye rather small, situated near the upper profile. There are four anterior canine teeth in each of the jaws, the middle of which are very strong; the two lower middle ones are received between the two upper middle ones. No other teeth are visible in the upper jaw, where they are replaced by very indistinct granulations of the bone, which is not covered by mucous membrane. The lower lateral teeth are small, and united into a low ridge. Scales on the operculum smaller than those on the body; the muciferous channel of the lateral line branches off into numerous short tubes on each of the scales. The scales which cover the base of the caudal are the largest, triangular, forming a sort of sheath for the fin. The last dorsal spine is not much longer than the anterior ones, two-sevenths of the length of the head; the third anal spine is somewhat shorter and stronger than the last of the dorsal fin. The ground-colour appears to have been reddish, without any other markings.

	inches.	lines.
Total length	15	8
Height of the body	4	0
Length of the head	3	8
——— of the pectoral	2	11½
——— of the ventral	2	3
——— of the last dorsal spine	0	11
——— of the third anal spine	0	9

Third Group. JULIDINA.

10. XIPHOCHILUS.

Xiphocheilus, *Bleek. Nias,* p. 223.

Body oblong, covered with large scales. (L. lat. 28–29.) Head scaly, nearly as high as long; snout obtuse; both limbs of the præoperculum, the posterior and the inferior, are naked. Lateral line continuous. Fins not scaly at the base. Formula of the fins: D. $\frac{11-12}{9-8}$. A. $\frac{3}{10}$. The upper lip is thin, sword-shaped, and can be nearly entirely hidden below the præorbital. Both jaws anteriorly with four canine teeth; the lateral teeth united into an osseous ridge; a posterior canine tooth. Branchiostegals six.

Indian Ocean and Archipelago.

1. Xiphochilus typus.

Bleek. l. c. p. 224, and *Atl. Ichth.* tab. 21. fig. 7

D. $\frac{12}{8}$. A. $\frac{3}{10}$. L. lat. 28.

The height of the body is contained four times and a half in the total length, the length of the head four times and three-fifths; head obtuse, as high as long; the maxillary extends to below the posterior half of the orbit; canine teeth large, green-coloured. The præorbital as high as the orbit. Scales on the head large, those on the cheek in three series; limbs of the præoperculum naked; operculum terminating in a broad membrane. Olive: head, body and fins with blue stripes edged with violet: one curved across the snout, from one eye to the other, another from the eye to the intermaxillary, a third from the lower jaw towards the operculum; the streaks on the body are oblique, descending backwards, subinterrupted. Dorsal with two or three longitudinal stripes, anal and caudal with transverse ones. (*Bl.*)

Sea of Nias.

2. Xiphochilus robustus.

D. $\frac{11}{9}$. A. $\frac{3}{10}$. L. lat. 29. L. transv. 3/9.

Cheek with seven series of small scales.

Mauritius.

a. Thirteen inches long: stuffed. From Dr. Janvier's Collection.

Description of the specimen.—The height of the body is nearly equal to the length of the head, and is contained three times and two-fifths in the total length. Head nearly as high as long, with a very high cheek and obtuse snout. There are four strong canine teeth in each of the jaws, the outer ones of the mandible being turned outwards; an obtuse osseous ridge round the edge of the jaws, with scarcely any distinct teeth; posterior canine tooth strong. Præorbital elevated, much higher than the orbit; cheek with seven series of small scales, the limbs of the præoperculum being naked; scales of the operculum nearly as large as those of the body, arranged in three series. Præoperculum not serrated. Dorsal spines stout, the last being the longest, one-third of the length of the head; the soft dorsal and anal are not scaly at the base and extend backwards to the root of the caudal. Caudal rounded. The third anal spine is the longest, stronger but rather shorter than the last dorsal spine. The first ventral ray produced. The colour, in a dried state, is uniform yellowish, perhaps red during life; a yellow longitudinal band runs along the basal half of the anal fin, and another appears to occupy the middle of the dorsal.

11. SEMICOSSYPHUS.

Cossyphus, sp., *Cuv. & Val.*
Semicossyphus, *Günth. Ann. & Mag. Nat. Hist.* 1861, vol. viii. p. 384; *Bleek. Proc. Zool. Soc.* 1861, p. 415.

Body compressed, oblong, with rather small scales; head longer than high. Scales on the cheeks and opercles; base of the vertical fins and limbs of the præoperculum not scaly. Lateral line not interrupted. Four canine teeth in each jaw anteriorly; no posterior canine tooth; an obtuse osseous ridge round the edges of the jaws, without distinct lateral teeth. Formula of the fins: D. $\frac{12}{10}$. A. $\frac{3}{12}$.

Coasts of Japan and California.

1. Semicossyphus reticulatus.

Cossyphus reticulatus, *Cuv. & Val.* xiii. p. 139; *Richards. Ichth. Chin.* p. 255; *Bleek. Act. Soc. Sc. Indo-Nederl.* vi. *Japan*, vi. p. 72.
Labrus reticulatus, *Schleg. Faun. Japon. Poiss.* p. 161. pls. 83, 83 *a*, & 84.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 49–50.

Snout rather pointed in young age (specimens of twelve inches in length); a large adipose hump is developed with age on the forehead and on the chin; head longer than high; præoperculum not serrated; dorsal fin not scaly; caudal subtruncated, ventral produced. Uniform greyish-violet or greyish-red.

Sea of Japan.

2. Semicossyphus pulcher.

Labrus pulcher, *Ayres, Proc. Cal. Acad. Nat. Sc.* i. 1854, p. 3.

D. $\frac{12}{10}$. A. $\frac{3}{12}$.

Dr. Ayres describes this species, which appears to be allied to *Semicossyphus reticulatus*, as follows:—

The height of the body is one-fourth of the total length. Forehead protuberant, especially in large individuals, from an accumulation of fat immediately above the eyes. Lips thick, fleshy. Teeth on the intermaxillaries and in the lower jaw alike, consisting externally of a single row, stout and conical, of which the two anterior pairs are much larger than the others and project forward; within this external row is a band of blunt, rounded teeth, scarcely projecting above the membrane. Pharyngeal teeth flat, tessellated, tubercular. Operculum and suboperculum scaly, præoperculum naked. Scales deeply imbedded, extending but slightly on the vertical fins; cutaneous flaps of the dorsal spines long. The length of the ventral is one-seventh of the total; caudal slightly concave. Dark blackish-brown, anterior portion of the trunk sometimes red.

Coast of San Diego (California).

12. TROCHOCOPUS.

Body oblong, covered with scales of moderate or rather small size (L. lat. 45–62); head scaly, as long as, or longer than, high, with the snout of moderate extent; both limbs of the præoperculum are naked, not serrated. Lateral line continuous. Base of the soft dorsal not scaly. Formula of the fins: D. $\frac{11-12}{10}$. A. $\frac{3}{12}$. Both jaws with four canine teeth anteriorly; lateral teeth distinct; a posterior canine tooth.

Indian Ocean. Galapagos Islands.

1. Trochocopus opercularis.

D. $\frac{11}{10}$. A. $\frac{3}{12}$. L. lat. 45.

Head much longer than high, one-third of the total length (the caudal fin not included); snout produced, conical; cheek with about six series of small scales. Dorsal spines of moderate strength and length, pungent, gradually becoming longer posteriorly. Uniform yellowish (in a dried state), with a black spot on the end of the operculum.

Mauritius?

a. Six inches long: stuffed: not good state. From Dr. Janvier's Collection.

2. Trochocopus darwinii.

Cossyphus darwinii, *Jenyns, Zool. Beagle, Fishes,* p. 100. pl. 20.
Labrus aper, *Valenc. in Voy. Vénus, Zool.* p. 338, *Poiss.* pl. 8. fig. 1.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 62.

Snout pointed; head nearly as long as high; præoperculum without serrature; fins not scaly; the soft dorsal and anal and the caudal lobes produced into points; scales on the cheek imbricate. Red, with a large yellow spot above the pectoral, and with a black spot anteriorly on the dorsal fin.

Galapagos Islands.

With a little attention, Valenciennes might have convinced himself that *Labrus aper* is identical with the fish described by Jenyns. The latter very careful ichthyologist had only a dried skin for examination, owing to which the form of the fish has been represented much too elongate: the posterior canine tooth appears to have been lost in that specimen.

13. DECODON.

Cossyphus, sp., *Poey*.

Body moderately compressed, oblong, covered with large scales. Head longer than high; cheeks, opercles, and lower limb of the præoperculum scaly, only the posterior limb being naked; base of the vertical fins not scaly; lateral line continuous. Teeth in the jaws in a single series; four canines in each jaw anteriorly; a posterior canine tooth. Formula of the fins: D. $\frac{11}{10}$. A. $\frac{3}{10}$.

Caribbean Sea.

1. Decodon puellaris.

Cossyphus puellaris, *Poey, Mem. Cub.* ii. p. 210.

D. $\frac{11}{10}$. A. $\frac{3}{10}$. L. lat. 30. L. transv. $\frac{2\frac{1}{2}}{8}$.

Eye rather large, as wide as the interorbital space, but somewhat shorter than the snout. The height of the body is two-ninths of the total length. Posterior edge of the præoperculum minutely denticulated, angle rounded, somewhat projecting beyond the posterior edge. Operculum produced into a membranaceous flap. Ventral fin not prolonged; dorsal and anal fins not scaly; caudal emarginate. Rose-coloured, with three large red blotches; head with several pearl-coloured streaks: a transverse one between the nostrils, two oblique ones running from the orbit towards the suboperculum, and a broad one from the angle of the mouth to the angle of the præoperculum.

Caribbean Sea.

a. Fine specimen. South America (probably Barbadoes). Presented by Sir R. Schomburgk.

14. PTERAGOGUS.

Pteragogus, *Peters in Wiegm. Arch.* 1855, p. 261.

Body compressed, oblong, covered with large scales; imbricate scales on the cheeks and opercles; præoperculum serrated on its posterior margin. Teeth in the jaws in a single series; four canines anteriorly in each jaw; a posterior canine tooth? Base of the dorsal fin scaly. Formula of the fins: D. $\frac{10-11}{11-10}$. A. $\frac{3}{10}$.

Coast of Mozambique.

1. Pteragogus opercularis.

Cossyphus opercularis, *Peters in Wiegm. Arch.* 1855, p. 261 (not *Guich.*).

D. $\frac{11}{10}$. A. $\frac{3}{10}$. L. lat. 25. L. transv. $\frac{2}{5-6}$.

The upper profile of the head concave above the eyes; præoperculum distinctly serrated; operculum produced into a membranaceous flap reaching behind the level of the base of the pectoral; the first ventral ray twice as long as the second. Light reddish: a large black ocellus edged with yellow on the operculum and behind each of the two first dorsal spines; cheeks, sides of the body, the upper part of the caudal and the base of the anal dotted. (*Pet.*)

Mozambique.

2. **Pteragogus tæniops.**

Cossyphus tæniops, *Peters in Wiegm. Arch.* 1855, p. 262.

D. $\frac{10}{11}$. A. $\frac{3}{10}$. L. lat. 25. L. transv. $\frac{2}{5\text{-}6}$.

The upper profile of the head concave above the eyes; præoperculum distinctly serrated; operculum produced into a membranaceous flap reaching behind the level of the base of the pectoral; the first ventral ray twice as long as the second. No ocellus on the operculum; a single one behind the first dorsal spine; a vertical brown band over the head, through the eye towards the throat; caudal with transverse series of dark spots. (*Pet.*)

Mozambique.

15. COSSYPHUS *.

Cossyphus, sp., *Cuv. & Val.* xiii. p. 102.
Cossyphus, *Günth. Ann. & Mag. Nat. Hist.* 1861, vol. viii. p. 384.
Harpe et Lepidaplois, *Gill, Proc. Acad. Nat. Sc. Philad.* 1862, p. 140.

Body compressed, oblong, with scales of moderate size; snout more or less pointed; imbricate scales on the cheeks and opercles; vertical fins scaly on their basal portion. Lateral line not interrupted. Teeth in the jaws in a single series; four canine teeth in each jaw anteriorly; a posterior canine tooth (except in *C. gouldii*). Formula of the fins: D. $\frac{(13)\ 12\ (11)}{9\text{-}11}$. A. $\frac{3}{(10\text{-})\ 12\ (\text{-}14)}$.

Inhabitants of nearly all the seas between the tropics and of the parts adjoining them.

The genus as at present circumscribed forms a very natural group, with the exception of *C. gouldii*, which has eleven dorsal spines only and no posterior canine tooth; this species, however, is known only from a very large stuffed specimen.

Our knowledge of *C. tredecimspinosus* is not much more perfect; it is so nearly allied to the other species of this genus, that the occurrence of thirteen dorsal spines in the single specimen known does not appear sufficient to justify a generic separation.

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* 1. Cossyphus vulpinus, *Richards. Proc. Zool. Soc.* 1850, p. 71, and *Ann. & Mag. Nat. Hist.* 1851, vii. p. 287.—Australia. (D. $\frac{12}{11}$. A. $\frac{3}{12}$.)

2. Julis (?) rubecula, *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 423.—Queen Charlotte's Sound.

1. Cossyphus mesothorax.

Renard, tab. 26. no. 143; *Valent.* iii. p. 388. fig. 126.
Labrus mesothorax, *Bl. Schn.* p. 254.
Cossyphus mesothorax, *Cuv. & Val.* xiii. p. 129; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 13.
Scarus mordax, *Gronov. Syst. ed. Gray*, p. 64.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 30. L. transv. 4/12.

Snout pointed, its length being one-third of that of the head; upper lip broad, with folds; serrature of the præoperculum minute, distinct; caudal truncated. Head and anterior part of the body reddish-brown, posterior parts reddish-yellow, both colours separated by an oblique deep-black band running from the base of the pectoral towards the hind part of the spinous dorsal; axil black; a horizontal black band behind the angle of the mouth.

Molucca Sea.

a. Fine specimen. Ceram. From Mr. Stevens's Collection.
b. Fine specimen. Amboyna. Purchased of Mr. Frank.
c. Adult: skin. From Gronow's Collection.

2. Cossyphus axillaris.

Labrus axillaris, *Benn. Proc. Comm. Zool. Soc.* i. 1831, p. 166.
Cossyphus axillaris, *Cuv. & Val.* xiii. p. 131. pl. 371.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 34. L. transv. 5/13.

Snout pointed, one-third of the length of the head; head longer than high; upper lip broad, with folds; serrature of the præoperculum minute, indistinct; caudal fin subtruncated; the first ventral ray produced. Purplish-red anteriorly, posterior part of the body and fins yellowish: a black spot on the base of the pectoral, a second and third on the commencement of the spinous and of the soft dorsal, and a fourth behind the last anal spine; ventrals dotted with brown.

Mauritius; Madagascar; Ulea; New Hebrides.

a. Type of the species. Mauritius. From the Collection of the Zoological Society.
b. Adult. Mauritius. From Mr. Gerrard's Collection.
c. Adult. Madagascar. Presented by Dr. J. E. Gray.
d. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

3. Cossyphus leucosticticus.

Labrus leucosticticus, *Benn. Proc. Comm. Zool. Soc.* i. 1831, p. 166.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 32. L. transv. 4/12.

Snout pointed, one-third of the length of the head; head longer than high; upper lip broad, with folds; serrature of the præoperculum minute, indistinct; caudal fin truncated; the first ventral ray not produced. Yellowish (in spirits): a series of four white spots between the lateral line and the base of the dorsal fin; anterior portion of the back with series of blackish dots; axil black; anterior portion of the spinous dorsal fin white.

Mauritius.

a. Type of the species. Mauritius. From the Collection of the Zoological Society.

4. Cossyphus diana.

Labrus diana, *Lacép.* iii. pp. 451, 522. pl. 32. fig. 1.
Cossyphus diana, *Cuv. & Val.* xiii. p. 127; *Bleek. Sumatra*, iv. p. 86.

D. $\frac{12}{10}$. A. $\frac{3}{10-12}$. L. lat. 32. L. transv. 4/12.

Snout produced, pointed, its length being two-fifths of that of the head; head longer than high; upper lip broad, with folds; serrature of the præoperculum minute, indistinct; caudal fin truncate, ventral not produced. Three or four reddish-white spots above the lateral line; back of the tail and the portion between the lateral line and the soft dorsal with black spots; a black spot at the end of the lateral line.

Mozambique; Mauritius. Sumatra, Batjan, and Amboyna.

Var. *α*. A. $\frac{3}{12}$. A white spot before the origin of the lateral line; anal and ventral fins uniform.

a. Adult. Mauritius. From the Collection of the Zoological Society.
b. Half-grown: stuffed. Mauritius.

Var. *β*. A. $\frac{3}{10}$. Operculum without white spot. Ventral with one large, anal with two black spots.

c. Fine specimen. Amboyna. Purchased of Mr. Frank.

5. Cossyphus macrurus.

Labrus hirsutus, *Lacép.* iii. p. 429. pl. 20. fig. 1; *Cuv. Règne Anim.*
—— macrourus, *Lacép.* iii. p. 438. pl. 9. fig. 3.
—— rubro-lineatus, *Lacép.* iii. p. 433.
Crenilabrus chabrolii, *Less. Voy. Coqu. Zool. Poiss.* p. 133. pl. 38, cop. by *Guér. Iconog.* iii. pl. 42. fig. 3.
Labrus spilonotus, *Benn. Proc. Zool. Soc.* iii. 1835–36, p. 207.
Cossyphus maldat, *Cuv. & Val.* xiii. p. 114.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 34. L. transv. 6/13. Vert. 11/17.

Snout pointed, its length being more than one-third of that of the head in mature, and one-third in half-grown individuals; head longer than high; upper lip broad, with folds; serrature of the præoperculum minute, indistinct; caudal lobes slightly produced; the first ventral ray long. Head yellow, with eight violet longitudinal bands; body orange-coloured, with bluish longitudinal stripes or series of spots; a large black blotch between the soft dorsal fin and the anal; the spinous dorsal with a black spot anteriorly; the soft dorsal and anal with brown dots and with a black margin; the outer ventral ray blackish.

Mauritius.

a–b. Fine specimens. Mauritius. From the Collection of the Zoological Society.—Types of *Labrus spilonotus*, Benn.

c–d. Adult: stuffed: bad state. Mauritius.

6. Cossyphus bilunulatus.

Labrus bilunulatus, *Lacép.* iii. pp. 454, 526. pl. 31.
Cossyphus bilunulatus, *Cuv. & Val.* xiii. p. 121; *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Amboina,* ix. p. 4.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 34.

Snout pointed, head longer than high; serrature of the præoperculum only visible at the angle; caudal lobes slightly produced. Uniform yellowish-red, with a large black blotch between the soft dorsal fin and the lateral line, not extending on the fin; the spinous dorsal with a black blotch anteriorly.

Ile de France. Amboyna.

a. Half-grown. Mauritius. Purchased of M. Parzudaki.

This fish is perhaps merely a variety of *C. macrurus.*

7. Cossyphus albotæniatus.

Cossyphus albotæniatus, *Cuv. & Val.* xiii. p. 141.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 30.

Præoperculum very finely serrated, entirely scaly; caudal concave, its angles not being produced. A broad white longitudinal band below the eye, to the angle of the operculum, edged with brown inferiorly; four brown streaks between the eyes, and another broad one passing through them; an oblique brown streak from the angle of the mouth to the interoperculum; throat white, with brown spots. Body red, with brown longitudinal stripes, and with a large black blotch across the back of the tail; a black spot anteriorly on the dorsal fin. Fins yellowish. (*Val.*)

Sandwich Islands.

8. Cossyphus atrolumbus.

Cossyphus atrolumbus, *Cuv. & Val.* xiii. p. 123.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 35. L. transv. 6/14.

Posterior canine tooth very small, hidden in the skin. Snout pointed, its length being more than one-third of that of the head in mature, and one-third in half-grown specimens; head longer than high; upper lip broad, with folds; serrature of the præoperculum minute, distinct; caudal with the lobes somewhat produced, and with the margin convex in adult specimens; the first ventral ray elongate. Yellowish, with a large black blotch between the lateral line and the soft dorsal fin, extending forwards to the tenth dorsal spine. An oblong, vertical, bright-yellow or rose-coloured spot in front of the black one; the membrane between the anterior dorsal spines black.

Mauritius. West Pacific.

Var. *α*. The anterior spot of a rose-colour.

a–b. Young: stuffed. Mauritius. From Dr. Janvier's Collection.

Var. *β*. The anterior spot bright-yellow.

c. Nineteen inches long: stuffed. Minerva Reef (South-west Pacific). Voyage of the 'Herald.'
d. Twenty inches long: stuffed. Saumarey Reefs. Voyage of the 'Herald.' From Dr. Rayner's Collection.
e. Half-grown: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Variety *β*. is perhaps identical with *Labrus perditio* (Quoy & Gaim. Voy. Astrol. Poiss. p. 702. pl. 20. fig. 4); yet these naturalists give as the numbers of the fins, D. $\frac{10}{12}$, A. $\frac{3}{10}$, and the yellow and black spots are placed more backwards.

9. Cossyphus anthioides.

Crenilabrus anthioides, *Benn. Proc. Comm. Zool. Soc.* i. p. 167.
Cossyphus zosterophorus, *Bleek. Act. Soc. Sc. Indo-Nederl.* ii. *Amboina*, viii. p. 75.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 33.

Snout obtuse; head as high as long; serrature of the præoperculum very distinct; caudal with the lobes pointed, deeply emarginate. Yellowish-rosecoloured: inferior half of the head brown; a narrow, oblique, curved brown band commences on the upper margin of the soft dorsal fin and descends towards the abdomen, the convexity being directed forwards; two other brown bands run along the upper and lower margins of the tail and of the caudal fin; posterior part of the body with scattered, irregular brown spots; the spinous dorsal with a black spot anteriorly.

Amboyna.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Adult. From the Haslar Collection.—The brown transverse band is indistinct.
c. Adult: stuffed.

10. **Cossyphus tredecimspinosus.**

D. $\frac{13}{10}$. A. $\frac{3}{12}$. L. lat. 33. L. transv. 5/12.

Snout pointed, its length being more than one-third of that of the head; head longer than high; præoperculum not serrated. A large whitish blotch below the soft dorsal; a blackish cross-band in front of the blotch, descending from the ninth, tenth and eleventh dorsal spines.

Hab. —— ?

a. Twelve inches long. From the Haslar Collection.

Description.—The greatest depth of the body is above the ventral fins, equal to the length of the head, and one-third of the total length (without caudal). Head compressed, longer than high. Interorbital space very convex, nearly twice as wide as the orbit, the diameter of which is two-fifths of the length of the snout, and nearly one-seventh of that of the head. Snout pointed.

The scales on the cheek and interoperculum are small; those on the cheek are arranged in eight series, without the scales which cover the limbs of the præoperculum; opercular scales smaller than those on the body. The posterior limb of the præoperculum nearly twice as long as the inferior. Pectoral obliquely rounded, two-thirds as long as the head, with seventeen rays; the ventral has the outer ray prolonged, and rather exceeding the length of the pectoral; the spine is strong, its length being contained twice and two-thirds in that of the head. The dorsal fin commences above the base of the pectoral; the spines increase in length posteriorly, the first being rather shorter than the eye, the last as long as the ventral spine; the membrane between them is deeply notched, emitting a short lobe for each spine. The soft dorsal and anal do not extend to the root of the caudal, when laid backwards; there is a broad scaly sheath on the base of the dorsal and anal; anal spines strong, the third the longest, as long as the ventral spine. Caudal fin slightly rounded, but with the lobes produced.

Tubes of the lateral line not branched.

Each jaw with four strong, curved canine teeth, the outer of the upper jaw and the middle of the lower being smaller than the others; the lateral teeth are distinct, but united into a ridge; sixteen are found on each side of the lower jaw; intermaxillary with one or two posterior canines on each side. The interior of the jaw-bones is not covered by a mucous membrane, granular, containing numerous young teeth destined to replace the lateral ones.

The form of the lower pharyngeal bone is the same as in other *Cossyphi*, viz. hammer-like, with the anterior branch not longer than the lateral; posterior margin slightly convex; teeth pavement-like, those on the middle of the posterior margin much larger than the others, which are granular; those on the extremity of the front branch conical, distant.

The colours have apparently faded; the markings mentioned are very distinct, and the first ventral ray appears to be brownish, with the outer margin white.

11. Cossyphus eclancheri.

Cossyphus eclancheri, *Valenc. Voy. Vénus, Zool.* p. 340, *Poiss.* pl. 8. fig. 2.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 32.

Snout pointed, with the upper profile slightly concave; head longer than high; dorsal and anal fins produced, caudal emarginate. Vermilion, with two large, irregular black blotches, the anterior on the first six dorsal spines, the posterior extending over the whole soft dorsal and over a portion of the back of the tail. (*Val.*)

Galapagos Islands.

12. Cossyphus rufus.

Aipi mixira, *Marcgr.* pp. 145, 146.
Perro colorado, *Parra*, p. 3. lam. 3. fig. 1.
Turdus flavus, *Catesby*, ii. tab. 11. fig. 1.
—— rufus, *L. Syst. Nat.* i. p. 475; *L. Gm.* i. p. 1287; *Bl. Schn.* p. 244; *Lacép.* iii. p. 427.
Bodianus bodianus, *Bl.* iv. p. 33. tab. 223; *Shaw, Zool.* iv. p 569.
Lutjanus verres, *Bl.* taf. 255; *Bl. Schn.* p. 243; *Lacép.* iv. p. 209.
Sparus falcatus, *Bl.* taf. 258; *Bl. Schn.* p. 269; *Lacép.* iv. pp. 39, 127; *Shaw, Zool.* iv. p. 409. pl. 58.
Bodianus blochii, *Lacép.* iv. pp. 279, 290.
Harpe cœruleo-aureus, *Lacép.* iv. pp. 426, 427. pl. 8. fig. 2.
Labrus semiruber, *Lacép.* iii. p. 428; *Shaw, Zool.* iv. p. 487.
Sparus verres, *Shaw, Zool.* iv. p. 414.
Cossyphus bodianus, *Cuv. & Val.* xiii. p. 103.
—— verres, *Casteln. Anim. nouv. ou rares Amér. Sud*, p. 27.

D. $\frac{12-13}{10-9}$. A. $\frac{3}{11-12}$. L. lat. 32. L. transv. 5/13.

Snout pointed, its length being more than one-third of that of the head; head longer than high; upper lip thick, with folds; præoperculum not serrated; the soft dorsal and anal, the ventrals, and sometimes the caudal lobes produced. Yellowish, the upper parts backwards to the origin of the soft dorsal fin reddish-brown; sometimes more uniform.

Atlantic coasts of tropical America. St. Helena.

a. Adult. ? Cuba. From Mr. Gerrard's Collection.
b. Adult. South America. Presented by Sir R. Schomburgk.
c. Half-grown: bad state. Bahia. From Dr. O. Wucherer's Collection.
d. Adult: skin. Jamaica.
e–i. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.

13. Cossyphus pulchellus.

Poey, Mem. Cub. ii. p. 208.

D. $\frac{12}{9-10}$. A. $\frac{3}{12-13}$.

Snout pointed, head longer than high, lips thick, præoperculum finely denticulated; the soft dorsal and anal, the ventrals, and the caudal lobes, especially the upper one, are produced. Red, with a whitish-rosecoloured longitudinal band. (*Poey.*)

Cuba.

14. **Cossyphus opercularis.**

Cossyphus opercularis, *Guichen. in Guér.-Ménev. Rev. Zool.* 1847, p. 283 (not *Peters*).

D. $\frac{12}{9}$. A. $\frac{3}{12}$.

Snout conical; head longer than high. Præoperculum not serrated. Caudal rounded. Uniform yellowish (in a dried state); a black spot superiorly at the operculum. (*Guich.*)

Bourbon? Madagascar?

15. **Cossyphus unimaculatus.**

D. $\frac{12}{11}$. A. $\frac{3}{12}$. L. lat. 36. L. transv. 6/12.

Snout pointed, its length being more than one-third of that of the head; head longer than high; præoperculum minutely serrated. An oblong deep-black spot on the middle dorsal spines.

Australia.

a. Stuffed. Purchased of Mr. Cuming.

Description of the specimen.—The greatest depth of the body is above the base of the ventral fins, equal to the length of the head, and contained three times and four-fifths in the total length (taken from the end of the snout to the middle of the caudal margin). The head is compressed, longer than high, the width of the interorbital space being a little more than that of the orbit; the snout is conically pointed, its length being two-fifths of that of the head; the maxillary does not extend backwards to the vertical from the orbit. Both jaws are armed with four canine teeth anteriorly, the outer of which are the strongest, though of moderate size; there are seven rather small teeth on each side of the upper jaw, and fourteen in the lower; the posterior canine tooth is of moderate size, obliquely bent outwards; the interior of the jaws is not covered by mucous membrane. The scales on the cheek and on the interoperculum are small, the former disposed in seven series; the limbs of the præoperculum are naked; the operculum is covered with scales, which are smaller than those on the body. The length of the lower limb of the præoperculum is two-thirds of that of the posterior, which is minutely serrated. The pectoral fin has its margin obliquely rounded, and is more than half as long as the head: the ventral is somewhat longer, its first ray being produced; its spine is strong, two-fifths of the length of the head. The height of the dorsal fin gradually increases to the seventh soft ray; its spines are very strong, the last being more than twice as long as the first and equal to the ventral spine. The upper margin of the soft dorsal fin is even, terminating posteriorly in a point which is not prominent; the seventh ray is the longest, equal in length to the base of the soft dorsal. The anal spines are exceedingly strong, the third being the longest, nearly as long as the twelfth dorsal spine: the soft anal is lower than the soft dorsal, and has the lower margin straight; its longest ray is shorter than its base. Caudal fin emarginate, with the lobes produced. The tubes of the lateral line are not branched.

Ground-colour of the dried specimen red, with darker streaks along the series of scales; an oblong deep-black spot on the base between the sixth and eighth dorsal spines; the fifth and ninth have a small black speck.

	inches.	lines.
Total length	16	6
Distance of the snout from the middle of the posterior margin of the caudal	15	6
Height of the body	4	1
Length of the head	4	1
——— of the twelfth dorsal spine	1	7

16. Cossyphus diplotænia.

Harpe diplotænia, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 140.

D. $\frac{12}{11}$. A. $\frac{3}{13}$. L. lat. 33. L. transv. 5/12.

The length of the head scarcely exceeds the height of the body, which is one-fourth of the total length (to the end of the middle caudal rays). The upper profile of the head is not or very little gibbous in the adult. Præoperculum entire or scarcely crenulated. The soft dorsal and anal fins increase in length with the age of the fish, and in the adult the former extends nearly to, and the latter beyond the middle caudal rays, whilst the external rays of the caudal are twice as long as the middle. Brownish-yellow: a dark band commences behind the snout and is divided into two—the upper portion running along the back, and nearly joining its fellow from the other side on the back of the free portion of the tail, whilst the lower crosses the angle of the operculum, and is continued on to the middle of the tail, terminating near the caudal, and alternating with two spots behind the base of the caudal fin. Fins immaculate. (*Gill.*)

Coasts of Lower California.

Described from two specimens, nine and sixteen inches long.

17. Cossyphus pectoralis.

Harpe pectoralis, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 141.

D. $\frac{12}{11}$. A. $\frac{3}{13}$. L. lat. 32–33. L. transv. 5/12.

The height of the body is contained rather less than thrice in the total length (to the end of the middle caudal rays), the length of the head thrice and a third. Forehead very gibbous in the adult; præoperculum either entire or very slightly crenulated. The vertical fins become elongate with advancing age, so that, finally, the dorsal extends backwards nearly to, and the anal beyond the middle caudal rays, and the caudal lobes become twice as long as the middle rays. Brownish-yellow: pectoral with a large dark spot on its extremity. During life, blue, with a yellow patch behind the pectoral fins. (*Gill.*)

Coasts of Lower California.

Attains to a length of two feet.

18. **Cossyphus gouldii.**

Labrus gouldii, *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 353.

Cossyphus vel Lachnolaimus gouldii, *Richards. Voy. Ereb. & Terr. Fishes,* p. 132.

Cossyphus gouldii, *Richards. Ann. & Mag. Nat. Hist.* 1851, vii. p. 288, and *Proc. Zool. Soc.* 1850, p. 72. pl. 3. fig. 3.

D. $\frac{11}{11}$. A. $\frac{3}{11}$. L. lat. 39. L. transv. 6/14.

Posterior canine teeth none.

Four anterior canine teeth in each of the jaws. The upper profile of the head bent downwards in a regular curve; præorbital elevated; scales on the cheek not imbricate; præoperculum not serrated; dorsal fin scaly; caudal truncated. Uniform dark purplish.

Western Australia.

a. Thirty-nine inches long: stuffed. Western Australia. Presented by Mr. Gould.—Type of the species.

19. **Cossyphus scrofa.**

Labrus scrofa, *Cuv. & Val.* xiii. p. 93.

Crenilabrus caninus, *Lowe in Proc. Zool. Soc.* 1839, p. 84, and in *Trans. Zool. Soc.* ii. p. 186, & iii. p. 10.

D. $\frac{12}{10}$. A. $\frac{3}{12-14}$. L. lat. 50. L. transv. 6/19. Vert. 28.

Præoperculum serrated or entire. Snout pointed, its length being contained twice and two-thirds in that of the head. Red: the lower parts and the fins yellow, the dorsal and anal with brown spots; a large black blotch between the five anterior dorsal spines.

Madeira; Canary Islands; Cape Verde.

I have seen but one specimen, in the Collection of the Philosophical Society of Cambridge, and for a very short time only. Although the species differs from the others in the size of the scales, it did not appear to me to differ generically from *Cossyphus.*

16. CLEPTICUS.

Clepticus, *Cuv. & Val.* xiii. p. 265.

Body compressed, oblong, covered with scales of moderate size; snout obtuse; cleft of the mouth narrow, with a series of very small teeth anteriorly; no posterior canine tooth. Imbricate scales on the cheeks and opercles; dorsal and anal fins enveloped in scales; lateral line not interrupted. Formula of the fins: D. $\frac{12}{10}$. A. $\frac{3}{12}$.

Caribbean Sea.

1. Clepticus genizarra.

Rabirubbia genizarra, *Parra*, p. 44. lam. 21. fig. 1.
Clepticus genizarra, *Cuv. & Val.* xiii. p. 267. pl. 377; *Cuv. Règne Anim. Ill. Poiss.* pl. 89. fig. 1.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 35. L. transv. 5/12.

The height of the body is two-sevenths of the total length; the fourth and fifth rays of the dorsal and the seventh and eighth of the anal produced; caudal forked.

Caribbean Sea.

a. Adult: skin. Jamaica. From Dr. Parnell's Collection.

17. LABRICHTHYS*.

Labrus, sp., *Cuv. & Val.*
Labrus, sp., Tautoga, sp., et Julis, sp., *Richardson.*
Labrichthys, *Bleek. Floris*, p. 331.
Pseudolabrus et Labrichthys, *Bleeker, Proc. Zool. Soc.* 1861, pp. 413, 415.

Body compressed, oblong, covered with large scales; snout more or less pointed. Opercles scaly; cheeks more or less scaly; præoperculum not serrated; lateral line continuous. Teeth in the jaws in a single series; but there is sometimes an interior series of smaller teeth destined to replace those in function. Posterior canine tooth generally present. Formula of the fins: D. $\frac{9}{11}$. A. $\frac{3}{10}$.

Pacific. East Indian Archipelago.

Bleeker has established the genus *Labrichthys* for *L. cyanotænia*, and distinguished it from *Pseudolabrus* (*rubiginosus*) by the single series of teeth on the lower pharyngeal. *L. celidota* has two series, *L. tetrica*, *L. rubiginosa*, and *L. luculenta* have three. All these series are very irregular, and form rather a band or a patch.

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* 1. Labrus ephippium, *Cuv. & Val.* xiii. p. 96.—Java?
2. —— fucicola, *Richards. Proc. Zool. Soc.* 1840, p. 26, and *Trans. Zool. Soc.* iii. p. 136; *Voy. Ereb. & Terr. Fishes*, p. 127. pl. 54. figs. 1 & 2.—Tasmania and South Australia.
3. —— iris, *Solander, MS.*—Sir John Richardson has introduced into the literature a fish obtained on Cook's first voyage to the coast of New Holland, off Bustard Bay; there are no means of ascertaining its proper place in the system, but Solander's description is as follows:—"Dorsum pallide olivaceum, infra medium e cærulescenti-albidum. Vitta in medio quadruplex, *α*. superne lutescens, *β*. pallide cyanea, *γ*. lutescens, *δ*. griseo-cærulescens. Supra os fasciæ tres splendidæ, *α*. intense cærulea, *β*. flava, *γ*. ——. Capitis latera pallide cærulescentia ad pinnas pectorales ducta. Vittæ cæruleæ per iridem continuantur.—*Obs.* Vitta lateralis postice cyanea, ad basin pinnæ caudalis arcuata et inferne reflexa. Pinna caudalis rubescens, subpellucida; dorsalis lutescens; pinnæ pectorales e corneo-albidæ, pellucidæ; ventrales et pinna ani albido-pellucidæ.—*Obs.* Radius supremus pinnæ caudalis elongatus, ut cauda triplo longior."
4. Julis (?) rubiginosus, *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 425.—New Zealand.

We divide the species of this genus thus:—

- A. Cheeks with several series of scales.
  - *a.* Base of the dorsal fin not scaly, p. 113.
  - *b.* Dorsal scales extending on the base of the fin, p. 116*.
- B. Cheeks with only one or two series of small scales, p. 116.

A. Cheeks with several series of scales.

a. Base of the dorsal fin not scaly.

1. Labrichthys celidota.

Labrus celidotus, *Forst. Descr. Anim. cur. Licht.* p. 133; *Bl. Schn.* p. 265; *Richards. Voy. Ereb. & Terr. Fishes*, p. 53. pl. 31. figs. 1–5.
—— pœcilopleura, *Cuv. & Val.* xiii. p. 95.
Sparus notatus, *Solander, MS.*
Julis (?) notatus, *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 425.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 27. L. transv. 3/9. Vert. 10/13.

A posterior canine tooth (absent in young specimens). Reddish-olive (in spirits), with some irregular cloudy spots, several forming indistinct cross-bands; a large round brown patch on the lateral line, below the origin of the soft dorsal fin; two brown streaks radiate from the orbit to the shoulder and to the operculum, another across the præorbital. Anal fin with two brown spots near the base.

Coasts of New Zealand and Australia.

a. Fine specimen. Australia. Presented by Sir J. Richardson.
b. Adult. Port Essington. Presented by the College of Surgeons.
c–f. Half-grown. Botany Bay. Presented by the College of Surgeons.
g, h. Fine specimens. New Zealand. Presented by Captain Stokes.
i, k–u. Adult, half-grown, and young. New Zealand. From the Haslar Collection.
v. Adult: skeleton. New Zealand. From the Haslar Collection.

The intestinal tract is short, shorter than the entire fish; the stomach is merely a somewhat more dilated portion of the intestine, without a distinct pylorus; the intestine makes two short bends, an upper and a lower one; its posterior straight portion is narrower than the anterior, and separated from it by a circular valve. The ovaria are united posteriorly. The air-bladder is ovate, and has a thick membrane, which is not fixed to any other part of the abdominal cavity; there is no glandular mass in its internal cavity.

The transverse portion of the lower pharyngeal is provided with obtuse, rounded molars, which become more conical anteriorly; the teeth are pointed on the longitudinal portion of the bone, where they are arranged in three series, extending to the extremity.

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* We do not think it advisable to establish another genus for the species with the base of the dorsal fin naked, as this character is unaccompanied by any other; *L. luculenta* and *rubiginosa*, for instance, are extremely similar to each other.

2. Labrichthys bothryocosmus.

Labrus bothryocosmus, *Richards. Voy. Ereb. & Terr. Fishes*, p. 53. pl. 31. figs. 6–10.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 27. L. transv. 3/9.

A posterior canine tooth. Reddish- or greenish-olive (in spirits); a cluster of black spots between the lateral line and the hind part of the spinous dorsal fin. Infraorbital ring with a bluish streak. Dorsal and anal fins with a dark longitudinal band.

Coasts of South Australia and Tasmania.

a, b. Fine specimens. Types of the species. From the Haslar Collection.

3. Labrichthys psittacula.

Labrus psittaculus, *Richards. Proc. Zool. Soc.* 1840, p. 26, and *Trans. Zool. Soc.* iii. p. 141.

Tautoga psittacula, *Richards. Voy. Ereb. & Terr. Fishes*, p. 129. pl. 56. figs. 7–10.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 27. L. transv. 3/9. Vert. 9/16.

A posterior canine tooth. Two anterior canine teeth in each of the jaws; cheek entirely scaly below the eye, the scales being arranged in four series. Uniform hyacinth-red: the soft dorsal and anal with five or six series of yellow spots; a few streaks behind the angle of the mouth.

Tasmania.

a. Adult: stuffed. Tasmania. Presented by Mr. Gould.—The typical specimen appears to be lost.

4. Labrichthys rubiginosa.

Labrus rubiginosus, *Schleg. Faun. Japon. Poiss.* p. 165. pl. 86. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 26. L. transv. 3/9.

A posterior canine tooth. Brownish-red, with some white spots on the back; the spinous dorsal with some irregular black spots; anal with three indistinct brownish longitudinal streaks; body sometimes with four brownish longitudinal bands, two of which are continued on the side of the head.

Seas of China and Japan.

a. Adult. China.
b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—Type of *Labrus eothinus*, Richards.
Half-grown: Japan.

Sir John Richardson has named and described a *Labrus eothinus* (Ichthyol. Chin. p. 255), from a stuffed specimen in the British Museum Collection and from a drawing. The former is identical with *Labrus rubiginosus*, Schleg.; and with regard to the drawing, which is said to be numbered 197, I am unable to find it in Mr. Reeves's Collection. No. 197 represents a species of *Mastacembelus*; and none of the drawings of Labridæ correspond with Sir J. Richardson's description.

5. Labrichthys gayi.

Labrus gayi, *Cuv. & Val.* xiii. p. 97; *Guichen. in Gay, Hist. Chil. Zool.* ii. p. 299. lam. 8. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 25.

? A posterior canine tooth. Cheek covered with scales. Uniform reddish-brown; vertical fins dark-coloured.

Island of Juan Fernandez.

6. Labrichthys inscripta.

Labrus inscriptus, } *Richards. Voy. Ereb. & Terr. Fishes*, p. 134. pl. 56.
Tautoga inscripta, } figs. 1 & 2.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 25–27. L. transv. 3/9.

A posterior canine tooth. The anterior pair of mandibulary teeth long, subhorizontal. Cheek with five to seven series of small scales. Dark brown, with a pale mark on each scale, bearing some resemblance to the characters of the Persian alphabet. Some dark marks on the cheek and præoperculum, one on the base of the pectoral; the membrane connecting the first three dorsal spines is blackish, sometimes with pale specks. Anal fin uniform, or with many pale specks.

Norfolk Island; Raoul Island.

a. Type of the species: has been in chloride of zinc. Norfolk Island. Presented by Sir J. Richardson.
b. Fourteen inches long. Raoul Isand. Voyage of H.M.S. Herald.

7. Labrichthys laticlavius.

Labrus laticlavius, *Richards. Proc. Zool. Soc.* 1839, p. 99, and *Trans. Zool. Soc.* iii. p. 139, and *Voy. Ereb. & Terr. Fishes*, p. 128. pl. 56. figs. 3–6.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 26. L. transv. 3/9. Vert. 9/16.

A posterior canine tooth. Two anterior canine teeth in each of the jaws. Caudal rounded. Green, with two red (blackish in spirits) longitudinal bands, which are confluent on the side of the tail; another, rather indistinct and interrupted, along the lower side of the tail. Dorsal and caudal fins purplish, edged with vermilion and blue, and spotted posteriorly with round blue dots. The anal has along the base a narrow stripe of vermilion, then a broad one of yellow, edged above and below with blue, and lastly a band of purple, spotted thickly with blue and edged with the same.

Coast of Tasmania. King George's Sound.

a. Tasmania. Type of the species. From the Haslar Collection.
b Adult: skin. King George's Sound. Purchased of Mr. Leadbeater.

b. Dorsal scales extending on the base of the fin.

8. Labrichthys luculenta.

Labrus luculentus, } *Richards. Voy. Ereb. & Terr. Fishes*, p. 130.
Tautoga luculenta, }

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 25. L. transv. 3/7.

A posterior canine tooth. The interopercles overlapping each other. Four anterior canine teeth in the lower jaw and two in the upper; cheek with about six series of small scales. Greenish or reddish, each scale below the lateral line with a vertical silvery line; a black spot on the two first dorsal spines; sometimes two irregular brown lines along the snout and two blackish spots on the base of the soft dorsal fin.

Eastern and Western coasts of Australia. Norfolk Island.

a, b. Types of the species. Norfolk Island. Presented by Sir J. Richardson.
c–e. Types of the species. Australia. Presented by Sir J. Richardson.
f–g. Skins. Port Jackson. Purchased of Mr. Gould.
h. Adult: discoloured.

9. Labrichthys cyanotænia.

Labrichthys cyanotænia, *Bleek. Floris*, p. 331, and *Atl. Ichth.* p. tab. 22. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 25.

A posterior canine tooth. Four anterior canine teeth in the upper, and two in the lower jaw; head longer than high; lips broad, fleshy; præoperculum entirely scaly, not serrated. Brownish-violet, with about fifteen blue longitudinal stripes; vertical fins brownish, edged with yellow, and with series of blue streaks or spots; base of the pectoral black. (*Bl.*)

Floris.

C. Cheek with only one or two series of small scales.

10. Labrichthys tetrica.

Labrus tetricus, *Richards. Proc. Zool. Soc.* 1840, p. 25, and *Trans. Zool. Soc.* iii. p. 136.
Tautoga tetriga, *Richards. Voy. Ereb. & Terr. Fishes*, p. 126. pl. 55. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 27. L. transv. 3/9.

A posterior canine tooth. Two anterior canine teeth in each of the jaws; cheek with only two series of narrow scales, a large portion of it being naked. Uniform purplish-red: vertical fins dark on the base, lighter towards the margins, and with a fine blackish edge; pectoral with a black spot superiorly at the base.

Coasts of Tasmania and South Australia.

a. Skin. South Australia. Purchased of Mr. Gould.
b–d. Half-grown: skins. Swan River.
e. Type of the species. From the Haslar Collection.

11. Labrichthys parila.

Tautoga parila, *Richards. Proc. Zool. Soc.* 1850, p. 70, and *Ann. & Mag. Nat. Hist.* 1851, vol. vii. p. 286.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 27. L. transv. 3/10.

Posterior canine tooth none. Two anterior canine teeth in each of the jaws; cheek with only one (indistinct) series of scales, the greater part of it being naked. Greenish, irregularly spotted and dotted with brown, the spot on the anterior dorsal spines being darker than the others.

Coasts of Australia.

a. Skin. Swan River.—Type of the species.
b. Skin. West Australia. From Mr. Gould's Collection.
c. Skin. Australia.
? *d*. Skin. Australia.—This specimen belongs probably to another species, having a posterior canine tooth; it is in a very bad state of preservation.

12. Labrichthys gymnogenis.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 25. L. transv. 3/10.

A posterior canine tooth. Cheek nearly naked, only a single series of small scales descending from behind the eye to below the infraorbital ring. Greenish (in a dried state), with more or less numerous whitish spots; anal fin with a dark longitudinal band; vertical fins with a narrow dark edge.

Australia.

a–b. Stuffed. Australia.

Description.—The form is the same as in all the fishes of this genus; the height of the body is one-third or rather less than one-third of the total length, the length of the head three times and three-fifths; head longer than high; snout pointed, of moderate length. Each jaw has two canine teeth in front, the lower of which are subhorizontal and received between the two upper ones; the lateral teeth are rather small, especially the posterior ones and those which stand behind the canines. Scales of the operculum nearly as large as those on the body; the muciferous channels of the scales of the lateral line are divided into five or six branches. Spines of the fins of moderate strength and length; none of the fin-rays produced; long pointed scales cover the basal half of the caudal membrane.

	inches.	lines.
Total length	9	0
Height of the body	3	0
Length of the head	2	6
——— of the ninth dorsal spine	0	9
——— of the third anal spine	0	8
——— of the pectoral fin	1	11

13. Labrichthys punctulata.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 27. L. transv. 3/10.

A posterior canine tooth. Cheek nearly naked, some rudimentary scales being situated near the limb of the præoperculum. Yellowish-olive (in a dried state), with numerous bluish dots; they are edged with brownish on the middle of the length of the fish, and entirely brownish posteriorly on the tail
Swan River.

a–b. Fourteen inches long: skin. Swan River.

Description.—The form is the same as in all the fishes of this genus. Head longer than high. The upper jaw has two canines in front, and a series of lateral conical teeth, within which there is another series destined to replace the former. The præorbital is wider than the orbit; the naked limb of the præoperculum is very broad; scales of the operculum as large as those of the body; the tube of each scale of the lateral line is divided into fourteen to sixteen branches, occupying nearly the whole of a scale. Spines of the fins of moderate length and strength; none of the fin-rays produced; base of the dorsal and anal not scaly.

	inches.	lines.
Total length	14	0
Length of the head	3	11
——— of the ninth dorsal spine	0	11½
——— of the third anal spine	0	10½
——— of the caudal fin	2	0
——— of the pectoral	2	4
——— of the ventral	1	6

To this genus perhaps belongs

14. Labrichthys (?) unilineata.

Cossyphus unilineatus *Guichen. in Guér.-Ménev. Rev. Zool.* 1847, p. 284.

D. $\frac{9-10}{10-12}$(?). A. $\frac{3}{12(?)}$.

A posterior canine tooth. Two anterior canine teeth in each of the jaws; head scaly, longer than high; præoperculum not serrated. Brownish (in a dried state), with a yellowish band from the snout, below the eye, to the upper part of the tail. (*Guich.*)
Guam.

18. LABROIDES.

Labroides, *Bleek. Banda*, i. p. 249.
Labroides et Diproctacanthus, *Bleek. Proc. Zool. Soc.* 1861, p. 415.

Body compressed, oblong, covered with scales of moderate size; snout pointed, with the lips prominent, one or the other notched anteriorly. Opercles, cheeks, and base of the vertical fins scaly; præ-

operculum not serrated; lateral line continuous. Teeth in the jaws minute, forming a band; a pair of curved, erect canines in each jaw, the upper pair received between those of the lower; a posterior canine tooth. Formula of the fins: D. $\frac{9}{9\text{-}11}$. A. $\frac{(2)\,3}{9\text{-}10}$. The gill-membrane is attached to the isthmus.
Red Sea. East Indian Archipelago.

Dr. v. Bleeker separates this genus into two:—

a. The lower lip divided into two lobes; anal spines three: *Labroides*, p. 119.

b. The lower lip without produced lobes; anal spines two: *Diproctacanthus*, p. 120.

a. *Labroides*, Bleek.

1. Labroides dimidiatus.

Labrus latovittatus, *Rüpp. N. W. Fische*, p. 7. taf. 2. fig. 2 (not *Lacép.*).
Cossyphus dimidiatus, *Cuv. & Val.* xiii. p. 136.
Labroides latovittatus, *Bleek. Act. Soc. Sc. Indo-Nederl.* ii. *Amboina*, viii. p. 73, and *Atl. Ichth.* p. . tab. 44. fig. 1.

D. $\frac{9}{10}$. A. $\frac{3}{10}$. L. lat. 50.

Lips fleshy, both emarginate anteriorly. Head much longer than high, pointed. A black band from the snout through the eye to the extremity of the caudal fin, gradually becoming broader posteriorly and occupying nearly the whole of the caudal fin; the inner half of the soft dorsal and anal brown, the outer yellowish; caudal fin with the upper and lower margins whitish.
Red Sea. Amboyna; Goram.

a. Seventeen lines long. From Dr. P. v. Bleeker's Collection.

2. Labroides paradiseus.

Valent. iii. p. 348. fig. 8, and p. 407. fig. 193; *Renard, Poiss. Mol.* i. tab. 24. fig. 131.
Labroides paradiseus, *Bleek. Banda*, i. p. 249, and *Atl. Ichth.* p. tab. 44. fig. 2.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 50.

Lips fleshy; two anterior canine teeth in each of the jaws. Head much longer than high, pointed. A black band from the snout through the eye to the caudal fin, bent downwards posteriorly to the lower margin of the tail, and leaving a great portion of the lower part of the caudal fin white. Fins yellowish; dorsal and anal fins black at the base.
East Indian Archipelago.

a. Thirty lines long. From Dr. P. v. Bleeker's Collection.

If I had not seen Dr. P. v. Bleeker's accounts, I should not have hesitated to consider his *L. paradiseus* as identical with Rüppell's *L. latovittatus*, and the small specimen, named by Bleeker *L. lato-*

vittatus, as the young state of that species. I find the same number of scales in both, and not forty only, as stated by Bleeker for *L. paradiseus*. But the two specimens to which my observations were limited differ in the number of the dorsal rays, as noticed by Bleeker. It is still possible that this is merely a variation, and that both fishes are specifically the same.

3. **Labroides quadrilineatus.**

Labrus quadrilineatus, *Rüpp. N. W. Fische*, p. 6. taf. 2. fig. 1.
Cossyphus tæniatus, *Cuv. & Val.* xiii. p. 134.
—— quadrilineatus, *Cuv. & Val.* xiii. p. 135.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 30. L. transv. 4/12.

The front part of the upper lip swollen, prominent; lower lip prominent, deeply emarginate anteriorly. Head much longer than high, pointed. Brownish or blackish, with two blue longitudinal bands, the space between them being generally darker than the ground-colour or entirely black; the membrane between the anterior dorsal spines black; caudal with a whitish margin.

Red Sea.

a. Fine specimen. Red Sea. From Dr. Rüppell's Collection.

b. *Diproctacanthus*, Bleek.

4. **Labroides xanthurus.**

Labroides xanthurus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado en Makassar*, p. 52.
Diproctacanthus xanthurus, *Bleek. Atl. Ichth.* p. . tab. 21. fig. 2.

D. $\frac{9}{9\ 10}$. A. $\frac{2}{9}$. L. lat. 40.

Lips very thick, the lower not notched. Head much longer than high, pointed. Brownish, with two light-bluish longitudinal bands, the space between them being darker than the ground-colour or black. Fins yellow. (*Bl.*)

Amboyna.

19. **DUYMÆRIA.**

Duymæria, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 52.

Body compressed, oblong, covered with large scales; lateral line continuous; opercles and cheeks with large scales; præoperculum serrated on its posterior margin. Teeth in the jaws in a single series, with four strong canines anteriorly in each jaw; a posterior canine tooth (in the species examined). The uppermost scales on the back are dilated, turned upwards, forming a sheath for the fin. Formula of the fins: D. $\frac{9}{11-12}$. A. $\frac{3}{9}$.

From the coast of Mozambique to Japan and the New Hebrides.

1. Duymæria aurigaria.

Crenilabrus aurigarius, *Richards. Voy. Sulph. Fishes*, p. 90. tab. 45. figs. 1 & 2.
—— rubellio, *Richards. l. c.* p. 93. tab. 45. fig. 3.
Duymæria aurigaria, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p.53.
—— rubellio, *Bleek. l. c.*

D. $\frac{9}{11}$. A. $\frac{3}{9}$. L. lat. 22. L. transv. 2/6. Vert. 10/15.

Two posterior canine teeth on each side of the upper jaw. Præoperculum finely serrated, with two series of large scales, which are partly imbedded in the skin. The lobes of the anterior dorsal spines are more or less prolonged. Purplish: vertical fins with irregular red lines; sides of the head with tortuous blue bands; a dark spot on the operculum remains visible in specimens preserved in spirits.

China.

a, b. Adult. China.—Types of *C. aurigarius*.
c. Adult. China. Presented by J. R. Reeves, Esq.—Type of *C. rubellio*.
d. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
e. Adult: skeleton. China.

It is probable that Schlegel is right in supposing that this species is identical with *D. flagellifera*. The chief differences between the descriptions appear to be:—

1. The specimen of Valenciennes has a black spot between the two first dorsal spines; none on the operculum. (*Duymæria flagellifera*, Cuv. & Val., Bleek.)

2. The figure in the 'Fauna Japonica' does not show any dark spot. (*Duymæria japonica*, Bleek.)

3. The fishes in the British Museum, described by Sir J. Richardson under two different names, have a dark opercular spot; none on the dorsal fin. (*Duymæria aurigaria* and *D. rubellio*, Richards., Bleek. =*D. aurigaria*, m.)

Duymæria amboinensis, Bleek. *l. c.* p. 54, and Atl. Ichth. p. 78. tab. 23. fig. 7, appears to me to be identical with *D. aurigaria*. The blue bands on the head of the species from China and Japan disappear in spirits, and are entirely absent in the Amboynese species.

a. Adult. From Dr. P. v. Bleeker's Collection as *D. amboinensis*.

2. Duymæria flagellifera.

Ctenolabrus flagellifer, *Cuv. & Val.* xiii. p. 240; *? Faun. Japon. Poiss.* p. 166. pl. 86. fig. 2.
Duymæria flagellifer, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p.53.
? Duymæria japonica, *Bleek. l. c.*

D. $\frac{9}{11}$. A. $\frac{3}{9}$. L. lat. 20.

Præoperculum finely serrated. The lobes of the anterior dorsal spines prolonged. [Purplish, head with tortuous blue bands;] a black spot between the first two dorsal spines.

Japan.

3. Duymæria spilogaster.

Crenilabrus spilogaster, *Bleek. Japan*, p. 416, and *Verhand. Batav. Genootsch.* xxvi. *N. Nalez. Japan.* p. 113. tab. 8. fig. 2.
Duymæria spilogaster, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. p. 54.

D. $\frac{9}{11}$. A. $\frac{3}{9}$. L. lat. 26.

Posterior canine tooth? Præoperculum distinctly serrated, with two series of large scales. Anal spines strong. Brownish-yellow, anteriorly and posteriorly with a violet shade; a violet spot on the operculum; body with violet dots disposed in longitudinal series; caudal yellow, with violet margin. (*Bl.*)

Sea of Nagasaki.

4. Duymæria filamentosa.

Cossyphus filamentosus, *Peters in Wiegm. Arch.* 1855, p. 263.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 25. L. transv. 2/7.

Two small posterior canine teeth on each side of the upper jaw. The membrane behind each dorsal and anal spine is prolonged into a very long black filament, sometimes nearly as long as the head. Green, with fine vertical blue lines below the eye; occiput with black dots; back and lateral line with black spots irregularly distributed; the middle of the side of the body with lighter spots and black dots; all the fins, except the pectorals, variegated with darker and lighter.

Mozambique.

a. Adult. Mozambique. From Prof. Peters's Collection.

5. Duymæria cæruleomaculata.

D. $\frac{9}{11}$. A. $\frac{3}{9}$. L. lat. 25. L. transv. 2/8.

Two posterior canine teeth on each side of the upper jaw; præoperculum distinctly serrated; anterior dorsal spines with yellow filiform lobes. Brownish-olive (in a dried state), each scale with a large blue spot in the centre.

Aneiteum (New Hebrides).

a. Stuffed. From Mr. Macgillivray's Collection.

Description of the specimen.—With regard to the general form, this species does not differ from its congeners. The height of the body is contained three times and one-third in the total length, the length of the head three times and a half. Each of the jaws anteriorly with four canine teeth, the outer of which are bent outwards. Cheek with two series of scales; præoperculum with the limbs naked, and with the posterior limb distinctly serrated. Pectorals rounded; spines of the fins rather strong: that of the ventral and the last of the dorsal are nearly equal in length, their length being less than one-half of that of the head; the second dorsal spine is not much shorter than the last; the membrane behind the two or three anterior dorsal spines is filiform, the filaments being not quite so long as the spines. The third anal spine is longer than the second, but rather shorter than the last of the dorsal fin. Caudal rounded.

The ground-colour is now brownish-olive, each scale having a blue centre; the lower jaw blue-spotted; some dark-brown spots on each side of the occiput, along the lateral line, on the interoperculum, and on the spinous portions of the fins; the soft dorsal fin with series of brown dots. Traces of a dark spot are visible on the extremity of the operculum.

	inches.	lines.
Total length	5	7
Height of the body	1	8
Length of the head	1	6
——— of the last dorsal spine	0	$7\frac{1}{2}$

6. Duymæria enneacanthus.

Crenilabrus enneacanthus, *Bleek. Amboina,* iii. p. 120.
Duymæria enneacanthus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. p. 54, and *Atl. Ichth.* p. 78. tab. 23. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{9}$. L. lat. 24.

The two or three posterior teeth of each side of the intermaxillary are larger than the lateral ones. Anterior dorsal spines with the lobes produced. Green, with rose-coloured longitudinal bands; each scale with four to eight blue dots on the margin; fins red, violet towards the margin; dorsal filaments blackish; pectorals rose-coloured; caudal dotted with violet.

Amboyna.

a. Not good state. From Dr. P. v. Bleeker's Collection.

7. Duymæria nematoptera.

Crenilabrus nematopterus, *Blèek. Banda,* i. p. 250.
Duymæria nematopterus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. p. 54, and *Atl. Ichth.* p. 79. tab. 23. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{9}$. L. lat. 24.

Posterior canine tooth?

Dorsal and anal spines with long filaments. Green: head with red bands; dorsal filaments black. Ventrals reddish-violet. (*Bl.*)

Sea of Banda Neira.

20. CIRRHILABRUS.

Cirrhilabrus, *Schleg. Faun. Japon. Poiss.* p. 167.
Cheilinoides, *Bleek. Natuurk. Tydschr. Nederl. Ind.* 1851, ii. p. 71.

Body compressed, oblong, covered with scales of moderate size; cheeks and opercles with imbricate scales; præoperculum serrated; teeth in a single series, with stronger teeth anteriorly in addition. Lateral line interrupted. Formula of the fins: D. $\frac{11}{9}$. A. $\frac{3}{9}$.

Japanese Sea. East Indian Archipelago.

1. Cirrhilabrus temminckii.

Cirrhilabrus, sp., *Schleg. l. c.*
Cirrhilabrus temminckii, *Bleek. Verhand. Batav. Genootsch.* xxv. *Japan,* p. 17.

D. $\frac{11}{9}$. A. $\frac{3}{9}$.

The height of the body equals the length of the head, and is about one-fourth of the total. Caudal rounded; the second and third ventral rays produced into a long filament, extending to the end of the anal. Brownish-green (in spirits), with a whitish band along the base of the dorsal and another along the middle of the side. Dorsal and anal fins with a blackish edge, and with a blackish band along the middle of the dorsal; anal with a blackish band along its base. (*Schleg.*)

Japanese Sea.

2. Cirrhilabrus solorensis.

Bleeker, Solor, p. 88, and *Atl. Ichth.* p. 76. tab. 23. fig. 3.

D. $\frac{11}{9}$. A. $\frac{3}{9}$. L. lat. 24. L. transv. 7–8.

The height of the body is contained four times in the total length, the length of the head four times and a third. The second ventral ray is produced, extending to the origin of the anal; caudal rounded. Reddish-violet: several small deep-violet spots on the middle of the sides, below the posterior half of the spinous dorsal; an oblong spot of the same colour before the root of the pectoral. Spines and rays of the vertical and ventral fins blue.

Seas of Solor and Banda.

a. From Dr. P. v. Bleeker's Collection.

3. Cirrhilabrus cyanopleura.

Cheilinoides cyanopleura, *Bleek. Natuurk. Tydschr. Nederl. Ind.* 1851, ii. p. 72. pl. 1.
Cirrhilabrus cyanopleura, *Bleek. Atl. Ichth.* p. 76. tab. 23. fig. 1.

D. $\frac{11}{9}$. A. $\frac{3}{9}$. L. lat. 22.

The height of the body is one-fourth of the total length, the length of the head two-ninths. Ventral fin not prolonged; caudal rounded. Greenish-olive, with a longitudinal series of several crescent-shaped blue spots behind the pectoral. (*Bl.*)

Sea of Batavia.

21. DORATONOTUS.

Body compressed, oblong, covered with large scales; (? cheeks and opercles scaly). The spinous dorsal is composed of nine spines, its middle being strongly depressed. Teeth in a single series; a posterior canine tooth. Lateral line interrupted.

Caribbean Sea.

1. Doratonotus megalepis.

D. $\frac{9}{10}$. A. $\frac{3}{9}$. L. lat. 19. L. transv. 2/5.

Ventral fins united at the base; caudal rounded.
Caribbean Sea.

a. Twenty-eight lines long. St. Christopher. Presented by Dr. J. E. Gray.

Description.—Although the single specimen is not in so good a state of preservation as to admit of a complete description of the species, its principal characters are so well marked that we cannot hesitate to consider it as the type of a distinct genus. The body is strongly compressed, its height being equal to the length of the head, and contained thrice and three-fourths in the total. The upper profile of the head descends in a nearly straight line. The snout is pointed, much longer than the eye, the diameter of which is one-fifth of the length of the head. The maxillary can be entirely hidden below the præorbital, and does not extend backwards to the anterior margin of the eye. Teeth conical, in a single series; each jaw with two canines in front, the lower received between the upper; the teeth standing next to the canines are somewhat larger than the rest; cheeks and opercles appear to have been scaly, but the scales are rubbed off. The first two dorsal spines are half as long as the head, whilst the following decrease in length to the ninth, which, again, is nearly as long as the second; the soft portion is somewhat higher than the spinous; the base of the dorsal fin is not scaly, but the scales of the uppermost series form a sort of sheath for the fin. The anal spines are rather strong and pungent, like those of the dorsal. Caudal rounded, not quite so long as the head. Pectoral rounded, two-thirds of the length of the head. Ventrals close together, united at the base by a membrane, situated somewhat in front of the pectoral, composed of a pungent spine and five soft rays. Gill-membranes united below, and not attached to, the isthmus. Lateral line interrupted below the end of the dorsal.

22. CHEILINUS *.

Cheilinus, *(Lacép.) Cuv. Règne Anim.*
Cheilinus, Oxycheilinus, et Crassilabrus, *Gill, Proc. Acad. Nat. Sc. Philad.* 1862, p. 143.

Body compressed, oblong, covered with large scales; lateral line interrupted; cheeks with two series of large scales; præoperculum entire; teeth in a single series, two canines in each of the jaws, none of which are bent outwards; no posterior canine tooth; lower jaw not produced backwards. Dorsal spines subequal in length; formula of the fins: D. $\frac{9-10}{10-9(11)}$. A. $\frac{3}{8(9)}$; the third anal spine is the longest.

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* 1. Cheilinus rivulatus, *Cuv. & Val.* xiv. p. 86.—New Ireland, Vanicolo.
2. —— venosus, *Cuv. & Val.* xiv. p. 100.—Red Sea.
3. —— mertensii, *Cuv. & Val.* xiv. p. 102.—Guam.
4. —— polygramma, *Cuv. & Val.* xiv. p. 103.—Ulea.
5. —— maculosus, *Cuv. & Val.* xiv. p. 104.—Oualan.
6. —— roseus, *Cuv. & Val.* xiv. p. 105.—Ulea.

From the eastern coasts of Africa to the Chinese Seas and the tropical parts of the Western Pacific.

1. Cheilinus trilobatus.

Cheilinus trilobatus, *Lacép.* iii. pp. 529, 537. pl. 31. fig. 3; *Rüpp. Atl. Fisch.* p. 22; *Cuv. & Val.* xiv. p. 79; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 34, and *Atl. Ichth.* p. 66. tab. 27. fig. 2; *Cuv. Règne Anim. Ill. Poiss.* pl. 86. fig. 2.
Labrus trilobatus, *Shaw, Zool.* iv. p. 487.
? Cheilinus sinuosus, *Quoy & Gaim. Voy. Uran. Poiss.* p. 278; *Cuv. & Val.* xiv. p. 95 (young).
Cheilinus nebulosus, *Richards. Ichth. Chin.* p. 261.
—— tetrazona, *Bleek. Sumatra*, ii. p. 293.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 20. Vert. 10/13.

The height of the body is one-third of the total length; snout subconical in young specimens and obtuse in adult ones. Canine teeth rather small. Caudal in young specimens rounded, in adult ones trilobed, the upper, lower and middle rays being more or less produced. Tubules of the lateral line much branched. Green: head with red stripes and dots, the former disposed before and below the eye; each scale on the body with one or two red vertical streaks. Vertical fins green, dorsal and anal with red margins; the soft dorsal sometimes red. A blackish spot at the base of the hinder dorsal rays, more distinct in immature specimens than in adult ones. Young specimens with four broad, irregular brownish cross-bands.

From the eastern coasts of Africa to China and the New Hebrides.

α. Specimens, 18–20 inches long, with the caudal lobes considerably prolonged.

a. Stuffed. Mauritius. From Dr. Janvier's Collection.
b. Stuffed. From the Collection of the Zoological Society.

β. Specimens, 9–12 inches long, with the caudal strongly convex, and with the upper and lower rays slightly produced.

c. Stuffed. Aneiteum. From Mr. Macgillivray's Collection.
d. China. Presented by Sir J. Richardson.

γ. Specimens, 2–8 inches long, with the caudal simply rounded.

e. Stuffed. Aneiteum. From Mr. Macgillivray's Collection.
f. Moluccas.
g. Amboyna. Purchased of Mr. Frank.
h. China. Presented by Sir J. Richardson.—Type of *Ch. nebulosus*, Richards.
i–k. From the Haslar Collection.

2. Cheilinus mossambicus.

? Cheilinus radiatus, *Cuv. & Val.* xiv. p. 91.
Cheilinus radiatus, *Peters, Wiegm. Arch.* 1855, p. 264 (not *Bl. Schn.*).

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 20.

The height of the body is rather less than the length of the head, and one-third of the total length (without caudal); head longer than high; snout subconical, one-third of the length of the head, without prominent chin. Scales on the cheek in two series, the lower of which is composed of three scales covering the præopercular limb. Caudal fin in adult specimens (4–5 inches long) two-lobed, with the upper and middle rays prolonged. Tubules of the lateral line simple. Brownish-olive (in spirits), clouded with blackish; yellow lines radiate from the orbit; a violet spot behind the orbit; the spinous dorsal brownish-black; the upper part of the soft dorsal, the anal and caudal with reticulated yellow lines.

Coast of Mozambique.

a. Four and a half inches long. Presented by Prof. Peters.

3. Cheilinus ceramensis.

Bleeker, Amboina & Ceram, p. 290, and *Atl. Ichth.* p. 69. tab. 28. fig. 4.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 21.

The height of the body is two-fifths of the total length (the caudal fin not included). Canine teeth rather small; snout very obtuse. Caudal fin with the upper and middle rays produced, the lower corner of the fin being rounded. Tubules of the lateral line scarcely branched. Greenish, with some dark blotches along the middle of the side; head with yellow dots and lines radiating from the orbit; the spinous dorsal violet, red-edged, with a blue spot between the first and second spines; the upper portion of the soft dorsal, the posterior part of the caudal, and the anal fin with reticulated yellow lines, enclosing blackish ocelli.

East Indian Archipelago. New Hebrides.

a. Six inches long. Amboyna. Purchased of Mr. Frank.
b. Six inches long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

4. Cheilinus punctatus.

Cheilinus punctatus, *Benn. Proc. Comm. Zool. Soc.* i. p. 167.
—— punctulatus, *Cuv. & Val.* xiv. p. 87. pl. 396; *Peters, Wiegm. Arch.* 1855, p. 264.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 22.

The height of the body is one-third, or rather less than one-third, of the total length; canine teeth of moderate size. Caudal rounded, with the upper lobe slightly produced in adult specimens. Tubules of the lateral line moderately branched. Greenish-brown: head with round yellow spots, body with series of red dots along the rows of scales. The spinous dorsal brown, with numerous blue spots, its margin and the soft dorsal being red; *anal red, with a few blue spots* and with a blue intramarginal band. Caudal violet, red towards the margin, with numerous small blue ocelli. *Ventral purplish, with some scattered bluish spots.*

Mauritius. Mozambique.

a, b, c. Types of the species. From the Collection of the Zoological Society.—Only the largest specimen, which is nine inches long, shows the upper caudal lobe slightly produced, whilst this fin is rounded in two other specimens of seven and eight inches in length.

Although Valenciennes mentions only nine dorsal spines in the text, we see from the figure that the specimens in the Paris collection also have ten; the dots on the ventral fin are represented too numerous in that figure.

5. Cheilinus chlorurus.

Sparus chlorurus, *Bl.* v. p. 24. taf. 260; *Bl. Schn.* p. 269; *Lacép.* iv. pp. 55, 163.
Cheilinus guttatus, *Bleek. Verh. Bat. Gen.* xxii. *Labr. Cycl.* p. 36.
—— decacanthus, *Bleek. Banda*, i. p. 256.
—— chlorurus, *Bleek. Atl. Ichth.* p. 65. tab. 27. fig. 3.

D. $\frac{10}{9}$. A. $\frac{3}{8}$. L. lat. 22.

The height of the body is a little more than one-third of the total; snout subconical; canine teeth of moderate size. Caudal rounded, with the lobes slightly produced in adult specimens. Tubules of the lateral line moderately branched. Greenish-brown: head with round yellow spots, body with series of smaller dots. The spinous dorsal brownish, with red margin and black dots on the spines; the soft dorsal red; *anal and ventral with numerous very small yellow dots*; caudal green, yellow-spotted.

From Ceylon to the New Hebrides.

α. Specimens, 7 inches long, with the caudal lobes slightly produced.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Skin, discoloured. Ceylon. From Dr. Kelaart's Collection.

β. Specimens, 5½–6 inches long, with the caudal simply rounded.

c. Fine specimen. Ceram. From the Collection of Madame Ida Pfeiffer.
d. Stuffed. Aneiteum. From Mr. Macgillivray's Collection.

6. Cheilinus oxycephalus.

Bleek. Amboyna, iv. p. 349, and *Atl. Ichth.* p. 65. tab. 28. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{8}$. L. lat. 22.

The height of the body is rather more than the length of the head, and two-fifths of the total (without caudal); head a little longer than high. Canine teeth moderately strong; snout pointed, chin not prominent. Tubules of the lateral line simple, bifid or trifid. Caudal rounded. Uniform brown, with a series of six to eight darker spots along the side; the spinous dorsal brownish, with a black spot anteriorly, the soft yellow behind; ventrals and anal violet, spotted with yellow; caudal with transverse series of violet spots.

Batoe, Flores, Batjan, and Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

7. Cheilinus festivus.

Cuv. & Val. xiv. p. 104.

The height of the body is two-fifths of the total length. Brownish-olive, with numerous short vertical lines; snout with two or three lines.

Island of Oualan.

Known from a drawing only.

8. Cheilinus undulatus.

Rüpp. N. W. Fische, p. 20. taf. 6. fig. 2; *Cuv. & Val.* xiv. p. 108; *Bleek. Batav.* p. 492, and *Atl. Ichth.* p. 68. tab. 26. fig. 3.

D. $\frac{9\,(8)}{10}$. A. $\frac{3}{8}$. L. lat. 22. Vert. 9/14.

The height of the body is one-third or a little less than one-third of the total length, and equal to the length of the head; head a little longer than high, with a prominent hump in old specimens; jaws subequal anteriorly, lips thick. Tubules of the lateral line simple; the scales disappear with age on the head and front part of the trunk. Caudal rounded; ventrals not produced. Head and thorax with numerous undulated yellow vertical lines, scales of the body with similar lines of greenish colour; a blackish band on the snout and two oblique ones behind the eye. Vertical fins with numerous undulated lines.

Red Sea. Batavia.

9. Cheilinus fasciatus.

Renard, Poiss. Mol. tab. 26. no. 132; *Valent.* iii. nos. 74 & 113.
Sparus fasciatus, *Bl.* v. p. 18. taf. 257; *Bl. Schn.* p. 269; *Lacép.* iv. pp. 39, 127.
Labrus enneacanthus, *Lacép.* iii. pp. 433, 480.
Cheilinus fasciatus, pt., *Rüpp. Atl. Fische*, p. 23.
—— fasciatus, *Cuv. & Val.* xiv. p. 92; *Rüpp. N. W. Fische*, p. 18; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 31, and *Atl. Ichth.* p. 67. tab. 26. fig. 2.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 23. Vert. 10/13.

The height of the body is one-third of the total length. Caudal fin truncated, with the upper and lower rays slightly produced.

Tubules of the lateral line simple. Red, with six black cross-bands, the first below the anterior dorsal spines. Nape of the neck and extremity of the operculum with black spots; numerous black dots on the side of the abdomen; belly with numerous pearl-coloured dots; caudal with two black cross-bands—one across the basal half, the other on the posterior margin. Ventral rounded, blackish.

From the Red Sea through all the Indian Seas.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult: has been in chloride of zinc. Purchased of Mr. Frank.
c. Adult. Purchased of Mr. Brandt.
d. Adult: skeleton.

The *maxillary bone* of this species shows the peculiarity, that its lower extremity is bent forwards into a short hook, in the concavity of which the end of the intermaxillary is received.

10. **Cheilinus quinquecinctus.**

Cheilinus fasciatus, pt., *Rüpp. Atl. Fische*, p. 23.
—— quinquecinctus, *Rüpp. N.W. Fische*, p. 19. pl. 6. fig. 1.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 23.

The height of the body is a little less than one-third of the total length. Caudal fin rounded, each ray being produced beyond the membrane. Tubules of the lateral line simple. Brownish-green, with five light cross-bands: the first below the third and fourth dorsal spines, the fourth between the extremities of the dorsal and anal fins, extending on the posterior rays, the fifth across the base of the caudal. Several scales on the body with a blackish vertical band. Ventral rounded, blackish.

Red Sea.

a. Eleven inches long: stuffed. Red Sea. From Dr. E. Rüppell's Collection.—Larger specimens than the present appear to lose the light cross-bands.

11. **Cheilinus lunulatus.**

Labrus lunulatus, *Forsk.* p. 37.
Cheilinus lunulatus, *Rüpp. Atl. Fische*, p. 21. tab. 6. fig. 1; *Cuv. & Val.* xiv. p. 88.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 21. Vert. 9/14.

The height of the body is somewhat less than one-third of the total length. Caudal rounded, sometimes each ray produced beyond the membrane. Tubules of the lateral line slightly branched. Green; head with red dots; each scale on the body with a red vertical streak. A light band across the middle of the body; operculum with a short crescent-shaped yellow, black-edged streak near its extremity.

Red Sea.

a. Fourteen inches long: stuffed. Red Sea. From Dr. Rüppell's Collection.

12. Cheilinus bimaculatus.

Cuv. & Val. xiv. p. 96.

The height of the body is two-sevenths of the total length; caudal rounded, with the middle rays produced. Head with green lines; two series of brown dots above, and a band formed by reticulated green lines below, the lateral line. A bluish-black spot behind the eye, and another black one on the side, on the sixth series of scales. Dorsal with a black margin; margins of the anal and caudal blackish with lighter dots. (*Val.*)

Sandwich Islands.

13. Cheilinus mentalis.

Rüpp. Atl. Fische, p. 24.

D. $\frac{9}{10}$. A. $\frac{3}{8}$.

The height of the body is much less than one-third of the total length, or than the length of the head; lower jaw prominent; caudal truncated. Reddish, with a reddish-brown spot at the base of each scale; a large blackish spot behind the upper end of the gill-opening; fins reddish, with irregular brown spots along the rays. (*Rüpp.*)

Massaua.

14. Cheilinus radiatus.

Valent. fig. 176.
Sparus radiatus, *Bl. Schn.* p. 270. tab. 56.
Labrus diagramma, *Lacép.* iii. pp. 448, 517.
Cheilinus commersonii, *Benn. Proc. Comm. Zool. Soc.* i. p. 167.
—— coccineus, *Rüpp. Atl. Fische*, p. 23.
—— diagramma, *Cuv. & Val.* xiv. p. 98; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 38.
—— radiatus, *Bleek. Atl. Ichth.* p. 68. tab. 26. fig. 1.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 23.

The height of the body is less than the length of the head, and is contained thrice and three-fourths in the total. Snout somewhat produced and pointed, compressed. Anterior canine teeth strong. Caudal fin subtruncated; ventral rounded. Body uniform reddish or greenish; snout with whitish lines; the lower part of the gill-apparatus and of the cheek with oblique brown lines; the spinous dorsal clouded with brownish, the soft violet at the base; caudal green, with the upper and lower margins brownish.

From the eastern coasts of Africa to the Western Pacific.

a. Fine specimen. Moluccas.
b. Half-grown. Moluccas. From the Leyden Museum as *Ch. lacrymans*.
c, d. Half-grown. Amboyna.
e–f. Adult: stuffed. Louisiade Archipelago. Voyage of H.M.S. Rattlesnake.
g. Adult: stuffed. Cape Flattery (N.E. Australia). From Mr. Macgillivray's Collection.

15. Cheilinus lacrymans.

Cuv. & Val. xiv. p. 109; *Bleek. Atl. Ichth.* p. 71. tab. 23. fig. 6.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 23.

The height of the body is rather less than the length of the head, or than one-third of the total length (without caudal): the height of the head is contained once and a third in its length; its upper profile is concave. Snout twice as long as the eye, with the jaws subequal anteriorly; the lower series of scales does not cover the præopercular limb; tubules of the lateral line simple. Two red streaks between the eye and the mouth; upper parts of the head and trunk with red dots; opercles without brown streaks; no dark spot on the dorsal fin.

Java.

16. Cheilinus orientalis.

Cheilinus coccineus, *Bleek. Atl. Ichth.* p. 71. tab. 33. fig. 8 (not *Rüpp.*).

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 22.

The height of the body is much less than the length of the head, and two-ninths of the total: the height of the head is contained once and three-fifths in its length; its upper profile straight. Snout very long, nearly thrice as long as the orbit, with the jaws subequal anteriorly; the lower series of scales does not cover the præopercular limb; tubules of the lateral line simple. Caudal fin rounded. Oblique blue lines across the præ-, sub-, and interoperculum; snout with blue dots; a black blotch on the lateral line, behind its origin. A bluish-black spot between the first and third dorsal spines; the spinous dorsal with a red intramarginal line: caudal and anal with blue ocelli. (*Bl.*)

Batjan.

17. Cheilinus arenatus.

Cheilinus arenatus, *Cuv. & Val.* xiv. p. 101. pl. 397.
—— notophthalmus, *Bleek. Batavia*, p. 493, and *Atl. Ichth.* p. 72. tab. 28. fig. 1.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 23.

The height of the body is equal to the length of the head, and two-sevenths of the total; head longer than high, with the upper profile concave above the eye. Tubules of the lateral line simple. Caudal rounded, with the lobes produced; ventral not prolonged. Yellowish-olive, with a brown band along the side, commencing from the eye. Back dotted with brown and blue. A bluish-black spot between the first and third dorsal spines.

Mauritius. Java

a. Nine and a half inches long: stuffed. Mauritius.

Valenciennes states twelve soft rays for the anal fin in this and several other species, which is incorrect; his artist has represented the proper number.

18. **Cheilinus celebicus.**

Cheilinus celebicus, pt., *Bleek. Celebes*, iv. p. 171.
—— celebicus, *Bleek. Atl. Ichth.* p. 70. tab. 28. fig. 3.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 22.

The height of the body is less than the length of the head, and one-fourth of the total; head not quite twice as long as high; jaws subequal anteriorly; tubules of the lateral line simple. Caudal rounded. Rosy-olive: head with red streaks on the snout, and reticulated violet lines on the side; scales with red or violet dots: two large irregular blackish spots on the tail; dorsal with a deep-blue (blackish) spot between the first and second spines; the caudal, and sometimes the soft dorsal and anal, reticulated with violet.

East Indian Archipelago.

a. Sixty-eight lines long. From Dr. P. v. Bleeker's Collection.

19. **Cheilinus oxyrhynchus.**

Bleek. Atl. Ichth. p. 73. tab. 28. fig. 2.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 23.

The height of the body is less than the length of the head, and a little more than one-fourth of the total; the depth of the head is contained once and three-fifths in its length; snout produced, conical, with the jaws equal; tubules of the lateral line simple. Caudal rounded. Yellowish-olive (in spirits); snout without markings; reticulated brown lines on the hinder half of the head, on the body, and on the soft portions of the vertical fins; suboperculum crossed by several brown lines; two irregular blackish blotches on the tail; dorsal with a blackish spot between the first and second spines.

East Indian Archipelago.

a. Sixty-five lines long. From Dr. P. v. Bleeker's Collection.

20. **Cheilinus hoevenii.**

Bleeker, Versl. & Meded. Akad. Wet. Amsterd. Natuurk. 1862, p. 297, and *Atl. Ichth.* p. 70. tab. 27. fig. 1.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 22.

The height of the body equals the length of the head, and is two-sevenths of the total (with the caudal); the height of the head is contained once and a fourth in its length; the upper profile of the head is concave; snout more than twice as long as the eye; jaws subequal anteriorly; the lower series of scales does not cover the præopercular limb; tubules of the lateral line simple. Caudal fin rounded, not produced. Short red streaks radiate from the orbit; each scale on the body with several red dots; a very large, band-like brown spot on the lateral line of the tail; a blue spot between the first and second dorsal spines. (*Bleek.*)

Amboyna.

21. Cheilinus ketlitzii.

Cuv. & Val. xiv. p. 105.

Snout rather pointed; the upper profile of the head concave; caudal rounded. Rose-coloured, with red spots, and a blue spot on the opercle.

Ulea.

Known only from a drawing, four inches and a half long.

Cheilinus sanguineus (Cuv. & Val. xiv. p. 106), described from a drawing, eight inches long, is, perhaps, merely the adult state of *Ch. ketlitzii*; it has the caudal lobes produced.

23. PSEUDOCHEILINUS.

Pseudocheilinus, *Bleek. Proc. Zool. Soc.* 1861, p. 409.

Body compressed, oblong, covered with large scales; lateral line interrupted; cheeks with two series of large scales; præoperculum entire. Teeth in a single series; the upper jaw with a pair of very large canine teeth bent outwards and backwards; no posterior canine tooth; lower jaw not produced backwards. Nine dorsal spines, subequal in length; three anal spines, the middle of which is the longest.

East Indian Archipelago.

1. Pseudocheilinus hexatænia.

Cheilinus hexatænia, *Bleek. Act. Soc. Sc. Indo-Nederl.* ii. *Amboina*, viii. p. 84, and *Atl. Ichth.* p. 73. tab. 23. fig. 2.

D. $\frac{9}{11}$. A. $\frac{3}{9}$. L. lat. 24.

The height of the body is nearly equal to the length of the head, and contained thrice and a half or four times in the total length; head longer than high, with the upper profile concave; jaws equal anteriorly; chin not prominent. Tubules of the lateral line simple. Caudal rounded; ventral not prolonged. Olive, with six rosy longitudinal bands; head with numerous white dots inferiorly; a blackish ocellus superiorly at the base of the caudal; fins immaculate, with the spines and rays green.

Seas of Amboyna and Goram.

a. From Dr. P. v. Bleeker's Collection.

24. EPIBULUS.

Epibulus, *Cuv. Règne Anim.*

Body compressed, oblong, covered with large scales; lateral line interrupted; cheeks with two series of large scales; præoperculum entire; mouth very protractile, the ascending branches of the intermaxillaries, the mandibles and the tympanic being much prolonged. Teeth in a single series, two canines in each of the jaws; no posterior canine tooth. Dorsal spines pungent; formula of the fins: D. $\frac{9}{10}$. A. $\frac{3}{8}$.

Indian Ocean and Archipelago.

1. Epibulus insidiator.

Ruysch, i. p. 3. no. 6. tab. 2. nos. 6, 7.

Renard, pl. 42. nos. 209, 210, ii. pl. 4. fig. 13, pl. 17. fig. 81; *Valent.* iii. p. 375. fig. 86, p. 384. fig. 112.

Sparus insidiator, *Pall. Spicil. Zool.* viii. p. 41. tab. 5. fig. 1; *Bl. Schn.* p. 278; *Lacép.* iv. p. 120; *Shaw, Zool.* iv. p. 445.

Epibulus insidiator, *Cuv. & Val.* xiv. p. 110. pls. 398, 399; *Cuv. Règne Anim. Ill. Poiss.* pl. 88; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 40, and *Natuurk. Tydschr. Nederl. Ind.* vii. p. 458, and *Atl. Ichth.* p. 74. tab. 22. fig. 3.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 22. Vert. 10/13.

Vertical and ventral fins more or less produced.

Indian Ocean and Archipelago.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult. China. Presented by Sir J. Richardson.
c, d, e. Adult and half-grown.

25. ANAMPSES.

Anampses, *Cuv. Règne Anim.*

Body compressed, oblong, covered with scales of moderate size; lateral line continuous; head naked; præoperculum not serrated. Teeth in the jaws in a single series; two front teeth in each jaw prominent, turned forwards, compressed, with cutting edge; no posterior canine tooth. Formula of the fins: D. $\frac{9}{12}$. A. $\frac{3}{12}$.

From the eastern coasts of Africa to the Western Pacific.

1. Anampses cæruleo-punctatus.

Rüpp. Atl. Fische, p. 42. taf. 10. fig. 1; *Cuv. & Val.* xiv. p. 5; *Cuv. Règne Anim. Ill. Poiss.* pl. 87. fig. 2; *Bleek. Atl. Ichth.* p. 104. tab. 24. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27. L. transv. 4/10. Vert. 11/15.

Brownish (in spirits), each scale with a bluish-white spot, surrounded by a darker ring; head with rather numerous bluish vertical lines, some of which radiate from the eye. Dorsal with three series of bluish spots, anal with two; caudal with several similar spots; vertical fins edged with yellowish.

Red Sea. Mauritius.

a, b. Adult. Mauritius. From the Collection of the Zoological Society.
c, d. Adult: not good state.

2. Anampses meleagris.

Ruysch, Thes. i. p. 42. tab. 7. fig. 1, *a*.

Anampses meleagrides, *Cuv. & Val.* xiv. p. 12; *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 57, and *Atl. Ichth.* p. 102. tab. 24. fig. 1.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27.

Violet, each scale with a round white spot; head with numerous spots similar to those on the body. Dorsal and anal fins with a black, yellow and blue margin and with numerous white dots, but without longitudinal lines; caudal uniform yellow.

Mauritius; Amboyna.

a. Fine specimen. Mauritius. Presented by Sir J. Richardson.
b–c. Fine specimens. Amboyna. Purchased of Mr. Frank.

3. Anampses cuvieri.

Quoy & Gaim. Voy. Freyc. Poiss. p. 276. pl. 55. fig. 1; *Cuv. & Val.* xiv. p. 11.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27.

Brownish-olive, thoracic region red; each scale with a round white spot; head with small spots on its lower parts. Dorsal and anal fins with small blue dots and three or four blue longitudinal lines; caudal reddish near the base and greenish posteriorly.

Sandwich Islands.

a. Adult: skin. Sandwich Islands. From the Collection of the Zoological Society.
b. Adult: skin.

4. Anampses melanurus.

Bleeker, Act. Soc. Sc. Indo-Nederl. ii. *Amboina,* viii. p. 79, and *Atl. Ichth.* p. 103. tab. 25. fig. 1.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27.

Violet, each scale with a round white spot; head and thorax with spots which are much larger than those on the body; opercular membrane with a large black spot, edged with white anteriorly. Dorsal and anal with a yellow and black margin—the former with spots similar to those on the body, the latter with three blue, black-edged longitudinal stripes; caudal yellow, with the base black, and with a broad black transverse band on its posterior half. Pectoral brownish at the base. (*Bl.*)

Amboyna.

5. Anampses twistii.

Bleeker, Act. Soc. Sc. Indo-Nederl. i. p. 56.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 28.

Dorsal spines stiff. The upper parts violet; sides of the head and thoracic region yellow; tail yellowish-violet; opercular lobe blackish, with a red spot; no white spot on the scales of the thorax, belly, neck, and hind part of the tail; the other scales with a blue, blackish-edged dot. Dorsal and anal fins with two or three series of blue ocelli, and with a large black, blue-edged ocellus posteriorly near the base; anal with a white and black margin. Caudal brownish-yellow dotted with blue, and with a white margin. Pectoral with the base blackish-violet.

Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

6. Anampses amboinensis.

Bleeker, Act. Soc. Sc. Indo-Nederl. ii. *Amboina,* viii. p. 80, and *Atl. Ichth.* p. 103. tab. 25. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 29–30.

Dorsal spines flexible. Violet: scales on the back with a small roundish blue spot, those on the sides with a longitudinal stripe; lateral and inferior parts of the head with some blue spots and undulated lines. Dorsal and anal fins with a blackish and yellowish margin, and with three or four blue longitudinal streaks which are interrupted posteriorly. Caudal brownish-violet, with several blue ocelli and with a yellow and blackish crescent; its upper and lower margins are yellowish. Pectorals brown at the base.

Amboyna.

a. Adult. From Dr. P. v. Bleeker's Collection.

7. Anampses diadematus.

Anampses diadematus, *Rüpp. N. W. Fische,* p. 21. taf. 6. fig. 3.
? Anampses lineolatus, *Benn. Proc. Zool. Soc.* iii. 1837, p. 208.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 30.

Green: lips, a transverse streak above and below the mouth, a streak along the throat, a band between the eyes, some lines on the opercles, a vertical streak on each scale of the side of the body, and a longitudinal one on each scale of the thoracic region, blue. Vertical fins orange-coloured; a blue spot between every two rays of the dorsal; dorsal with a blue streak along the upper and lower margins; anal blue at the base and at the margin. Base of the pectoral blue.

Red Sea. Mauritius?

8. Anampses viridis.

Cuv. & Val. xiv. p. 13.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 24.

Uniform green; anal with yellowish margin. (*Val.*)

Mauritius.

9. Anampses geographicus.

Cuv. & Val. xiv. p. 10. pl. 389; *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina,* p. 58, and *Atl. Ichth.* p. 102. tab. 25. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 50. L. transv. 8/22.

Dorsal spines stiff. Brownish-violet, each scale with a blue vertical streak; head, thoracic region and caudal fin with reticulated, blue, darker-edged lines. Vertical fins with a yellow, blue and black margin; dorsal and anal with numerous small blue dots.

Amboyna.

a. Adult. From Dr. P. v. Bleeker's Collection.

10. Anampses pterophthalmus.

Bleeker, Act. Soc. Sc. Indo-Nederl. ii. *Amboina*, viii. p. 81, and *Atl. Ichth.* p. 102. tab. 24. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 52. L. transv. 7/24.

Dorsal spines stiff. Violet: sides of the head and tail yellowish-brown; two or three oblique blue lines between each pair of spines and rays of the dorsal and anal fins, and a black, yellow-edged ocellus posteriorly near the base of those fins. Caudal brownish-yellow, with a yellow posterior margin, and with blue longitudinal lines between the rays; pectorals brown at the base.

Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

26. HEMIGYMNUS.

Halichœres, sp., *Rüppell.*
Tautoga, sp., *Cuv. & Val.*

Body compressed, oblong, with scales of moderate size; cheeks rather high. Opercles naked; cheek with a stripe of very small scales; præoperculum not serrated; lateral line continuous. Teeth in the jaws in a single series; two canines in each jaw anteriorly, the lower pair received between the teeth of the upper; generally a posterior canine tooth. Formula of the fins: D. $\frac{9}{11}$. A. $\frac{3}{11}$.

From the Red Sea to the north coast of Australia.

1. Hemigymnus fasciatus.

Mullus fasciatus, *Thunb. Reise nach Japan*, iv. p. 351. tab. 314.
Labrus fasciatus, *Bl.* tab. 290; *Bl. Schn.* p. 249.
Sparus meaco, *Lacép.* iv. p. 161.
—— zonephorus, *Lacép.* iv. p. 155.
Labrus fuliginosus, *Lacép.* iii. pp. 437, 492, 493, 496.
—— malapteronotus, *Lacép.* iii. pp. 450, 516.
Scarus quinquefasciatus, *Benn. Fish. of Ceylon*, pl. 23.
Tautoga fasciata, *Cuv. & Val.* xiii. p. 303. pl. 379; *Bleek. Batav.* p. 484.
? Tautoga mertensii, *Cuv. & Val.* xiii. p. 308.
Cheilinus blochii, *Cuv. & Val.* xiv. p. 108.
Hemigymnus fasciatus, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 386; *Bleek. Atl. Ichth.* p. . tab. 46. fig. 2.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 30. L. transv. 5/11.

A posterior canine tooth. Lips very thick, with folds; the lower lips are notched anteriorly, broad, pendent, like wattles; cheek with a band of small scales. Body with five brownish-black cross-bands; ventral and anal blackish; the lower half of the soft dorsal yellowish, the upper blackish. A brownish spot behind the eye.

From Mauritius to the East Indian Archipelago. ? Carolines.

a, b. Half-grown. From the Collection of the Zoological Society.
c. Adult. Amboyna. Purchased of Mr. Frank.

2. Hemigymnus sexfasciatus.

Halichœres sexfasciatus, *Rüpp. N.W. Fische*, p. 18. taf. 5. fig. 3.
Tautoga sexfasciata, *Cuv. & Val.* xiii. p. 309.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 32. L. transv. $\frac{4\frac{1}{2}}{12}$.

A posterior canine tooth. Lips very thick, with folds; the lower lips are not continuous, broad, pendent, like the wattles of a cock; cheek with four series of small scales. Body with five or six dark-brown cross-bands; dorsal and caudal fins with numerous undulated red lines; anal blackish, with irregular blue lines; ventral yellowish.

Red Sea.

a. Adult. Red Sea. Presented by Dr. Rüppell.

3. Hemigymnus melanopterus.

Labrus melapterus, *Bl.* tab. 285.
Tautoga melapterus, *Cuv. & Val.* xiii. p. 311; *Bleek. Verhand. Batav. Genootsch.* xxii. p. 16; *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 358.
Tautoga, sp., *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 17.
Hemigymnus melanopterus, *Günth. l.c.*; *Bleek. Atl. Ichth.* p. . tab. 45. figs. 2 & 3.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 29. L. transv. 5/14.

A posterior canine tooth hidden by the skin. Lips very thick, with folds; the lower lip is notched anteriorly, each lateral part pendent, like a wattle. Cheek with a band of small scales. Back and sides between the vertical fins brownish, abdomen and thoracic region yellowish; a blackish blotch behind the orbit; dorsal and anal fins with a light margin, and with a bluish intramarginal band, edged with darker.

Singapore. East Indian Archipelago. Goram. Port Essington. Endeavour Reef (N.E. coast of Australia).

a. Half-grown. Celebes. Purchased of Mr. Brandt.
b. Fine specimen. Java. Purchased of Mr. Jamrach.
c. Adult: skin. From Gronow's Collection.
d. Adult: stuffed. Port Essington.
e. Adult: stuffed. Endeavour Reef. From Mr. Macgillivray's Collection.

4. Hemigymnus leucomos.

Tautoga leucomos, *Bleek. Biliton*, iv. p. 239.
Hemigymnus leucomos, *Bleek. Atl. Ichth.* p. . tab. 44. fig. 6.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 26–27.

No posterior canine tooth. Brownish-violet, with four whitish transverse bands: the anterior broad, between the front part of the dorsal fin and the belly; the second below the posterior dorsal spines, and not extending downwards to the lateral line; the third between the middle of the soft dorsal and of the anal; the fourth on the tail, behind the last dorsal and anal rays. (*Bl.*)

Biliton.

Is not this fish the young of *Hemigymnus fasciatus*?

27. STETHOJULIS *.

Julis, sp., *Cuv. & Val.*

Body compressed, oblong, covered with scales of moderate size; head entirely naked; lateral line not interrupted; scales on the thorax as large as, or larger than, those on the side of the body. A posterior canine tooth. Dorsal spines nine.

From the eastern coasts of Africa to the Western Pacific.

1. Stethojulis strigiventer.

Julis strigiventer, *Benn. Proc. Zool. Soc.* 1832, p. 184; *Cuv. & Val.* xiii. p. 468; *Bleek. Banda*, i. p. 251.

Stethojulis strigiventer, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 386; *Bleek. Atl. Ichth.* p. 135. tab. 43. fig. 1.

D. $\frac{9}{11}$. A. $\frac{2}{11}$. L. lat. 26. L. transv. 2/9.

The height of the body is one-fourth of the total length, the length of the head two-sevenths; caudal rounded; ventral rather short. Greenish: *lower parts of the sides with several yellow longitudinal lines* and with some black dots; a brownish band from the mouth, below the eye to the operculum; a black dot at the base of the penultimate dorsal ray; sometimes a small black spot on the base of the caudal fin.

From the eastern coasts of Africa to the northern coasts of Australia.

a. Adult. Mauritius. From Mr. Gerrard's Collection.—Type of the species.
b–d. Adult. Mozambique. From Prof. Peters's Collection.
e, f. Fine specimens. Amboyna. Purchased of Mr. Frank.
g. Half-grown. Port Essington. From the Haslar Collection.

2. Stethojulis trilineata.

Seba, iii. 31. 5; *Valent.* fig. 54.
Labrus trilineatus, pt., *Bl. Schn.* p. 253.
Julis sebanus, *Cuv. & Val.* xiii. p. 474.
—— casturi, *Bleek. Celebes*, iii. p. 768.
Stethojulis trilineata, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 386; *Bleek. Atl. Ichth.* p. 131. tab. 43. fig. 3.

D. $\frac{9}{11}$. A. $\frac{2}{11}$. L. lat. 26. L. transv. 2/9.

The height of the body equals the length of the head, and is two-sevenths of the total. Caudal rounded. Body with four white (in life, red) longitudinal stripes, edged with brown: the upper from the occiput along the base of the dorsal; the second from the snout through the upper part of the eye, along the anterior portion of the lateral line to the caudal; the third runs from the extremity of the snout, below the eye, through the opercular point, and terminates behind the pectoral; the fourth runs uninterruptedly from the angle of the mouth below the base of the pectoral to the caudal.

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* 1. Julis finlaysoni, *Cuv. & Val.* xiii. p. 471.—Ceylon.

East Indian Archipelago.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

3. **Stethojulis albovittata.**

Gallenay castouri, *Renard*, fig. 133.
Labrus albovittatus, (*Bonnat.*) *Lacép.* iii. pp. 443, 509.
Julis balteatus, *Quoy & Gaim. Voy. Uran.* p. 267. pl. 56. fig. 1; *Cuv. & Val.* xiii. p. 475; *Bleek. Banda*, i. p. 253.
Stethojulis albovittata, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 386; *Bleek. Atl. Ichth.* p. 132. tab. 44. fig. 5.

D. $\frac{9}{11}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. 2/9.

The height of the body equals the length of the head, and is two-sevenths of the total. Body with four longitudinal stripes (red during life): the upper is bluish (in spirits), sometimes indistinct, and runs from the upper margin of the orbit along the base of the dorsal; the others are yellow or white: the second proceeds from the snout, through the upper part of the orbit, and terminates behind the commencement of the lateral line; the third from the maxillary, below the eye, through the extremity of the operculum to the middle of the trunk, and sometimes continued on to the base of the caudal; the fourth crosses the lower jaw in a curve, traverses the præ- and sub-operculum, ascends along the gill-opening to behind the axil, where it is slightly interrupted, and runs finally in a gentle curve to the caudal.

Madagascar. East Indian Archipelago. Sandwich Islands.

a, b. Adult. Madagascar. Presented by Dr. J. E. Gray.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d, e. Adult: skin and stuffed. Sandwich Islands. From the Collection of the Zoological Society.

4. **Stethojulis renardi.**

Renard, i. tab. 30. fig. 160.
Julis renardi, *Bleek. Banda*, i. p. 253.
Stethojulis renardi, *Bleek. Atl. Ichth.* p. 132. tab. 43. fig. 2.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 29. L. transv. 2/10.

The height of the body is contained four times and a third in the total length, the length of the head thrice and a half. Body with three longitudinal stripes: the upper is bluish (in spirits), and runs from the occiput along the base of the dorsal; the others are white (in life, red): the second runs from the end of the gill-opening along the middle of the body to the root of the caudal; there is a minute black spot above its termination; the third band commences from below the root of the pectoral and terminates above the front part of the anal; a similar band on the head, running from the upper lip, below the eye, to the axil of the pectoral.

East Indian Archipelago.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

5. **Stethojulis interrupta.**

Valent. figs. 30, 447; *Renard*, i. fig. 60.
Julis interrupta, *Bleeker, Banda*, i. p. 252.
Stethojulis interrupta, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 386; *Bleek. Atl. Ichth.* p. 133. tab. 44. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28. L. transv. 2/9.

The height of the body is contained four times and two-thirds in the total length, the length of the head three times and three-fourths. Caudal fin convex. Green: an indistinct reddish-violet line on the back, along the base of the dorsal; another from below the root of the pectoral to the caudal, interrupted behind the pectoral and recommencing above the anal. Head with a reddish-violet band between snout and eye, and with another between the eyes. Fins immaculate; a large triangular black spot on the base of the pectoral, and a white spot above it.

East Indian Archipelago.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

6. **Stethojulis axillaris.**

Julis axillaris, *Quoy & Gaim. Voy. Uran. Zool.* p. 272; *Cuv. & Val.* xiii. p. 472.
—— bandanensis, *Bleeker, Banda*, i. p. 254.
Stethojulis axillaris, *Bleek. Atl. Ichth.* p. 136. tab. 44. fig. 7.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 25. L. transv. 2/10.

The height of the body is one-fourth of the total length, the length of the head two-sevenths. A small posterior canine tooth. Caudal convex. Back olive, with numerous bluish dots; tail with one or more very small black, yellow-edged ocelli; frequently a black spot between the posterior dorsal rays.

East Indian Archipelago. Madagascar. Sandwich Islands.

a. Adult: bad state. Madagascar. Presented by Dr. J. E. Gray.
b. Half-grown.

7. **Stethojulis kalosoma.**

Bleek. Amboina & Ceram, p. 289, and *Atl. Ichth.* p. 134. tab. 43. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27.

The height of the body is rather less than the length of the head, and is contained four times and a half or four times and two-thirds in the total. Head and back violet, *sides posteriorly with five series* *of brown spots*; fins greenish, immaculate; a short brown longitudinal streak, edged with white, from the opercular lobe to the end of the pectoral.

East Indian Archipelago.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.
b. Fine specimen. Amboyna. Purchased of Mr. Frank.

8. Stethojulis phekadopleura.

Julis phekadopleura, *Bleek. Verhand. Batav. Genootsch.* xxii. *Bali*, p. 8.
Stethojulis phekadopleura, *Bleek. Atl. Ichth.* p. 134. tab. 43. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 26.

The height of the body is more than one-fourth of the total length, and nearly equal to the length of the head. Head with a more or less distinct yellowish band from the snout, below the eye, to the operculum; upper parts densely dotted, sides reticulated with yellow; the lower parts of the side with series of brown dots; dorsal fin with yellow and violet spots, the other fins orange-coloured.

East Indian Archipelago.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

28. PLATYGLOSSUS[*].

Platiglossus, sp., *Klein, Pisc. Miss.* iv. p. 40.
Halichœres, sp., *Rüppell.*
Julis, sp., *Cuv. & Val.*
Halichœres, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 386.
Platyglossus, Halichœres, Macropharyngodon, Güntheria, et Hemitantoga, *Bleek. Proc. Zool. Soc.* 1861, pp. 411, 412, 413.
Chœrojulis, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 142.

Body compressed, oblong, covered with scales of moderate size (L. lat. 30 or less); head naked[†]; lateral line not interrupted; scales on the thorax smaller than those on the body. A posterior canine tooth; none of the anterior canine teeth are bent outwards and backwards. Dorsal spines nine.

Seas between the tropics and the parts adjoining them.

1. Platyglossus dussumieri.

? *Seba*, iii. tab. 31. fig. 2.
Sahnee moia, *Russell*, ii. fig. 120.

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[*] 1. Julis margaritaceus, *Cuv. & Val.* xiii. p. 484.—Vanicolo.
2. —— auritus, *Cuv. & Val.* xiii. p. 486.—Ulea.
3. —— purpureo-lineatus, *Cuv. & Val.* xiii. p. 471.—Ceylon.
4. *Renard*, fig. 115.—Julis punctulatus, *Cuv. & Val.* xiii. p. 483.—East Indies.
5. Julis horsfieldii, *Cuv. & Val.* xiii. p. 486.—Siam.
6. —— patatus, pt. (un quatrième individu, &c.), *Cuv. & Val.* xiii. p. 400.—Cuba.
7. —— gillianus, *Poey, Mem. Cub.* ii. p. 214.—Cuba.
8. Labrus pictus, *Gronov. Syst. ed. Gray*, p. 80.—East Indies.

[†] A few rudimentary scales behind the orbit in *P hortulanus* and *P. notophthalmus*.

? Labrus nigrescens, *Bl. Schn.* p. 263.
Julis dussumieri, *Cuv. & Val.* xiii. p. 478. pl. 387 (coloration incorrect); *Cant. Catal.* p. 236.
—— exornatus, *Richards. Ichth. Chin.* p. 258.
—— notophthalmus, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 20.
Halichœres nigrescens, *Bleek. Syn. Labr.* p. 14, and *Atl. Ichth.* p. 118. tab. 37. fig. 4.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 29. L. transv. 3/10. Vert. 10/15.

The height of the body is two-sevenths to two-ninths of the total length, the length of the head one-fourth. Caudal rounded; dorsal spines rather slender; the first ventral ray produced. *A bluish-black, yellow-edged ocellus between the fifth and seventh dorsal spines; corners of the caudal broadly yellow.* Brownish-green, with eight or nine dark cross-bands on the back; *pectoral with a bluish-black spot at the axil*; dorsal and anal fins with one or two series of large round yellow spots along the basal half.

Sea of China. East Indian Seas.

a. Adult: skin. Pinang. From Dr. Cantor's Collection.
b–c, *d*, *e*, *f*, *g*, *h*. Adult and half-grown. China.—Types of *Julis exornatus.*
i–k. Adult and half-grown. Chusan. From Dr. Cantor's Collection.
l. Fine specimen. From the Collection of the Zoological Society.
m. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
n. Adult: skeleton. China.

2. Platyglossus chloropterus.

?? Labrus chloropterus, *Bl.* taf. 288; *Bl. Schn.* p. 248.
Julis semidecorata, *Less. Mém. Soc. Hist. Nat.* iv. p. 403, and *Voy. Coqu. Zool.* ii. p. 138. pl. 25. fig. 2.
—— cuvieri, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 24 (not *Benn.*).
Halichœres chloropterus, *Bleek. Synon. Labr.* p. 12 [*].

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28. L. transv. 4/11.

The height of the body is contained thrice and two-fifths in the total length, the length of the head four times. Head with broad, irregular reddish-violet bands; a darker spot behind the orbit; anterior part of the body violet, the posterior and the tail yellowish; four series of yellow, blue-edged ocelli, confluent into bands, between the lateral line and the pectoral. *Pectoral with a violet streak across the base. Dorsal and anal yellow, the former with a broad violet band along the base,* serrated on the soft portion; *anal with a light band edged with violet* along the middle. The other fins uniform.

Java, Banka, and Celebes.

a. Fine specimen, 6½ inches long. From Dr. P. v. Bleeker's Collection.

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[*] Dr. v. Bleeker's description does not agree well with the specimen sent by him to the British Museum as *H. cuvieri*, Bleek. = *H. chloropterus*, Bl. We give, therefore, the description of the species as it appears in a preserved state.

3. Platyglossus javanicus.

Julis javanicus, *Bleek. Java,* iv. p. 341.
Halichœres javanicus, *Bleek. Atl. Ichth.* p. 125. tab. 40. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 28.

The height of the body equals the length of the head and is two-ninths of the total. Caudal rounded; dorsal spines pungent. Brownish-red: *head with reddish-violet streaks; a blue spot behind the orbit; a black spot superiorly at the base of the pectoral; lorsal with two to three series of yellow ocelli; anal immaculate;* caudal with numerous yellow ocelli and with the corners broadly edged with yellow. (*Bl.*)

Coast of Karangbollong. Singapore.

a. Four inches long: not good state. From Dr. P. v. Bleeker's Collection.

4. Platyglossus geoffroyii.

Julis geoffroyii, *Quoy & Gaim. Voy. Uran. Zool.* p. 270. pl. 56. fig. 3; *Cuv. & Val.* xiii. p. 479; *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado en Makass.* p. 58.
—— meleagris, *Cuv. & Val.* xiii. p. 481.
Macropharyngodon geoffroyi, *Bleek. Proc. Zool. Soc.* 1861, p. 412, and *Atl. Ichth.* p. 129. tab. 37. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27–28.

The height of the body is contained thrice and two-thirds in the total length, the length of the head four times and two-thirds to four times and a half. *Neck elevated.* Caudal rounded. Rosy-violet, each scale with a green, blue-edged ocellus; a black spot, divided into two by a yellow one, behind the operculum; thorax with two oblique greenish, blue-edged bands; *a black spot behind the isthmus*; head with short streaks and ocelli; dorsal with two series of yellow, blue-edged ocelli, one along the base, the other along the middle and partly confluent on the soft dorsal; *a violet, yellow-edged spot between the first and third spines*; anal coloured like the soft dorsal; caudal with five transverse series of similar ocelli and with the corners broadly edged with brown. Ventral with two or three ocelli. (*Bl.*)

Sandwich Islands, Ulea, Celebes.

a–b. Adult: stuffed.

5. Platyglossus bicolor.

Seba, iii. pl. 31. fig. 8.
Labrus bicolor, *Bl. Schn.* p. 267.
Julis mola, pt., *Cant. Catal.* p. 238.
—— margaritophorus, *Bleek. Batavia,* p. 487.
Halichœres bicolor, *Bleek. Synon. Labr.* p. 12, and *Atl. Ichth.* p. 118. tab. 39. fig. 5.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 30.

The height of the body equals the length of the head and is two-ninths of the total. Caudal rounded. Greenish: a violet band between the snout and the eye; sides of the head with oblong violet spots; *a reddish-violet spot behind the orbit; a violet band*, bordered by series of silvery ocelli, *runs from the operculum to the caudal*; scales on the back with a brown spot, *the spots on the nape forming two longitudinal series; a large black spot between the fifth and sixth dorsal spines; axil yellow.*

Java, Singapore, Pinang.

a. Adult: skin. Pinang. From Dr. Cantor's Collection.
b, c–d. Adult. Singapore.

It may be questioned whether the figure given by Seba should not more properly be referred to *Pl. maculipinnis*. I willingly adopt, however, Dr. v. Bleeker's opinion, in order not to increase the number of synonyms.

6. **Platyglossus scapularis.**

Julis scapularis, *Benn. Proc. Comm. Zool. Soc.* 1831, p. 167.
—— cœruleovittatus, *Rüpp. N. W. Fische*, p. 14. taf. 4. fig. 1 (var.).
—— elegans, (*Kuhl & v. Hass.*) *Cuv. & Val.* xiii. p. 467; *Bleek. Natuurk. Tydschr. Nederl. Ind.* iii. p. 289, ii. pl. 3.
—— leschenaultii, *Cuv. & Val.* xiii. p. 453.
—— phaiotænia, *Bleek. Batoe*, p. 322.
Güntheria cœruleovittata, *Bleek. Proc. Zool. Soc.* 1861, p. 413; *Versl. Akad. Wet. Amsterd.* xiii. p. 291, and *Atl. Ichth.* p. 137. tab. 32. fig. 2.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 25. L. transv. $\frac{2\frac{1}{2}}{10}$.

The height of the body equals the length of the head and is one-fourth of the total; caudal rounded; the outer ventral ray prolonged. *A broad brownish-violet band runs from the scapulary region towards the back* of the tail and is darkest anteriorly; a broad red, blue-edged band from the snout to the eye; another, irregular and oblique, ascends from below the eye to the commencement of the lateral band; a red streak descends from the axil to the abdomen. Anal and dorsal fins with a green, blue-edged band; caudal with reddish-violet more or less confluent transverse bands.

From the eastern coasts of Africa to the East Indian Archipelago.

a. Adult. Mauritius. From the Collection of the Zoological Society. —Type of the species.
b. Adult. Mozambique. From Prof. Peters's Collection.
c. Fine specimen. Ceram. Purchased of Mr. Frank.
d. Young: not good state. Amboyna. Purchased of Mr. Frank.
e. Adult: bad state. Purchased of Mr. Frank.
f. Young: not good state. From Dr. P. v. Bleeker's Collection. (*Julis phaiotænia*.)

In the variety figured by Rüppell, the red postocular band is continued along the front part of the lateral line; and the lateral band is not of a brownish, but of a blue colour. The specimen from Mozambique approaches the variety from the Red Sea. The markings on the head are exactly the same in all the specimens.

7. Platyglossus hortulanus.

Renard, i. tab. 11. fig. 71, ii. fig. 120; *Valent.* p. 376. fig. 87.
Labrus hortulanus, *Lacép.* iii. p. 516. pl. 29. fig. 2.
—— centiquadrus, (*Commers.*) *Lacép.* iii. p. 493.
Sparus decussatus, *Benn. Fish. of Ceylon*, pl. 14.
Halichœres eximius, *Rüpp. N. W. Fische*, p. 16. tab. 5. fig. 1.
Julis decussatus, *Cuv. & Val.* xiii. p. 433.
—— hortulanus, *Cuv. & Val.* xiii. p. 430; *Bleek. Batav.* p. 486.
Hemitautoga centiquadrus, *Bleek. Proc. Zool. Soc.* 1861, p. 413, and *Atl. Ichth.* p. 139. tab. 32. fig. 3.

D. $\frac{9}{11-12}$. A. $\frac{3}{11}$. L. lat. 28. L. transv. $\frac{2\frac{1}{2}}{9}$. Vert. 10/15.

The height of the body is contained three times and a third to three times and three-quarters in the total length, the length of the head four times or four times and a quarter. Two series of small scales behind the eye. Caudal subtruncated; the first ventral ray prolonged. Brownish-yellow, each scale with a brown vertical streak, the basal membrane being of that colour; head with broad bluish longitudinal bands; anterior part of the back with series of bluish spots; *one, two or three yellow spots on the back, the anterior never being absent*, situated below the fourth dorsal spine; *a black spot behind it.* Dorsal fin with pairs of oblique brownish streaks, sometimes anastomosing with one another and enclosing round spots. Caudal immaculate, or with transverse series of brownish spots; anal with some longitudinal bands. A black spot superiorly in the axil of the pectoral; generally a small black spot on the upper half of the root of the caudal.

From the eastern coasts of Africa to Polynesia.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.
b. Adult: stuffed. Mauritius. From Mr. Telfair's Collection.
c–d. Half-grown. Mauritius. Presented by Dr. E. Rüppell.
e, f. Adult. Ceylon. From the Collection of the Zoological Society.
g. Young. Moluccas.
h. Fine specimen. Amboyna. Purchased of Mr. Frank.
i. Adult: bad state. Celebes.
k–m. Half-grown: stuffed. East Indies. From the Collection of the East India Company.
n. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.
o, p–q. Adult and half-grown. From the Haslar Collection.
r. Adult: skeleton. From the Collection of the Zoological Society.

8. Platyglossus corbis.

Renard, ii. pl. 17. fig. 97 & pl. 25. fig. 120.
Julis corbis, *Cuv. & Val.* xiii. p. 435.

A large black, oblong blotch on the back along the base of the dorsal fin. Head blue, with yellow spots and black dots; each scale with a red vertical streak.

East Indies.

This fish has not yet been recognized, and is known only from a drawing by Vlaming.

9. Platyglossus opercularis.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 29. L. transv. $\frac{2\frac{1}{2}}{10}$.

The height of the body is contained four times and a third in the total length, the length of the head three times and four-fifths. A posterior canine tooth. Dorsal spines of moderate length, pungent. Caudal rounded. Ventral not produced. *Colours in spirits*: Head with a reddish-violet, darker-edged band running from the snout through the lower half of the eye to the operculum; a silvery band immediately below the first band. *A violet spot behind the orbit, and another larger one, edged with dark-brown, on the extremity of the operculum.* Lower third of the head whitish. Each scale on the upper half of the body has a blackish-brown margin and is pearl-coloured in the centre; a series of five pearl-coloured spots on the back along the base of the dorsal, the first spot being below the fourth dorsal spine; a second series of similar but less distinct spots below the lateral line; the lower half of the body is whitish, with two silvery lines on the side of the abdomen, descending obliquely forwards. *Base of the pectoral silvery-white*; pectoral transparent, ventral white. Dorsal fin yellowish, with pairs of oblique reddish-violet, darker-edged streaks, the streaks of each pair being confluent towards the base of the fin; *a very small black spot between the two first spines: a larger black, yellow-edged ocellus between the three first rays*, below the margin. Caudal yellowish, with the outer half indistinctly transversely striped; anal white, with some very indistinct greyish spots along the base.

Feejee Islands. Amboyna.

a–b. Thirty lines long. Feejee Islands. Voyage of the 'Herald.'
c. Four inches long: not good state. Amboyna. Purchased of Mr. Frank.

10. Platyglossus papilionaceus.

Julis papilionaceus, *Cuv. & Val.* xiii. p. 484.

D. $\frac{9}{11}$. A. $\frac{3}{11}$.

Caudal truncated. Blue spots and streaks on the body; a blue band between the eye and the snout, another on the præoperculum inferiorly; a vertical band descends along the margin of the præoperculum and crosses the operculum. *A dark-blue spot between the third and fourth dorsal spines*; dorsal and anal fins with lilac ocelli; caudal blackish on the middle of its margin. (*Val.*)

Vanicolo.

11. Platyglossus melanurus.

Julis melanurus, *Bleek. Banda*, i. p. 251, and *Solor*, p. 87.
Platyglossus melanurus, *Bleek. Syn. Labr.* p. 11, and *Atl. Ichth.* p. 109. tab. 46. fig. 1.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 25. L. transv. $\frac{2\frac{1}{2}}{10}$.

The height of the body equals the length of the head and is two-ninths of the total. Caudal convex. Brownish, with five dark cross-bands on the back; *caudal posteriorly with a large black spot in the middle,* or with a broad black crescent-shaped band; a blackish blotch on the side of the abdomen, covered by the pectoral fin. Head and anterior portion of the trunk with yellow bands; a short black streak anteriorly on the dorsal; a black spot superiorly in the axil; anal violet along the base, yellow along the middle, and with three blackish lines along the margin.

East Indian Archipelago.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Fine specimen. Purchased of Mr. Jamrach.

12. Platyglossus schwarzii.

Julis schwarzii, *Bleek. Verhand. Batav. Genootsch.* xxii. *Bali,* p. 7.
—— dieschismenacanthus, *Bleek. Banda Neira,* p. 645.
—— dieschismenacanthoides, *Bleek. Amboina,* iii. p. 121.
Halichœres schwarzii, *Bleek. Atl. Ichth.* p. 117. tab. 39. fig. 3.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27. L. transv. $\frac{2\frac{1}{2}}{10}$.

The length of the head is nearly equal to the height of the body, and two-ninths of the total. Caudal rounded; *the four anterior dorsal spines are divergent.* Greenish-yellow, with five or six more or less distinct violet cross-bands; each scale within the bands with a reddish-violet dot; *back with five or six yellowish spots* along the base of the dorsal, alternating with the cross-bands; head with undulated reddish-violet bands; two or three violet longitudinal bands between the lateral line and the pectoral; dorsal fin blue-edged, with a large blue spot between the fourth and sixth spines, and with three longitudinal series of red, blue-edged ocelli on the soft portion; anal blue-edged, with two series of blue-edged ocelli, and with a red, blue-edged band along the middle; *caudal with a blackish-violet spot posteriorly in the middle* and with numerous ocelli.

East Indian Archipelago.

a–b, c–d. Adult and half-grown. Amboyna. Purchased of Mr. Frank.
e, f. Adult and half-grown. From Dr. P. v. Bleeker's Collection.

13. Platyglossus hyrtelii.

Julis mola, pt., *Cant. Catal.* p. 238.
—— hyrtlii, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado en Makass.* p. 60.
Halichœres hyrtlii, *Bleek. Atl. Ichth.* p. 121. tab. 39. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 28.

The height of the body is one-fifth or rather less than one-fifth of the total length, the length of the head two-ninths. Caudal rounded; dorsal spines pungent. Greenish-rosecoloured, *with two brown longi-*

tudinal bands: the first is united on the snout with that of the other side, and proceeds above the eye, near the base of the dorsal, to the back of the tail; *the second* runs from the snout, through the eye, to the base of the caudal, and *is interrupted on the operculum by a bright-red spot.* Dorsal fin with three series of rosy ocelli edged with violet, and *with a violet spot between the first and third spines*; anal immaculate; *caudal* with rose-coloured ocelli, and *with a blackish ocellus superiorly at the base.* Pectoral with a blackish spot superiorly at the axil.

Pinang, Java, Nias, Celebes, and Sangi.

a. Half-grown. Pinang. From Dr. Cantor's Collection.
b. Half-grown: skin. Pinang. From Dr. Cantor's Collection.
c. Half-grown: not good state. From Dr. P. v. Bleeker's Collection.

Dr. Cantor has confounded two species under the name of *J. mola*, two of his typical specimens which are in the British Museum belonging to *J. hyrtelii*, Bleek., and a third to *Pl. bicolor*, Schn.

14. **Platyglossus knerii.**

Halichœres knerii, *Bleek. Syn. Labr.* p. 34, and *Atl. Ichth.* p. 119. tab. 39. fig. 1.

D. $\frac{9}{12}$. A. $\frac{2}{12}$. L. lat. 27. L. transv. 2/9.

The height of the body equals the length of the head, and is contained four times and a fourth in the total length. Brownish-olive (in spirits), *with two brown longitudinal bands* on each side: the upper on the back, along the base of the dorsal, confluent with its fellow on the nape; the second from the eye to the upper part of the base of the caudal; *an oblique brown spot between the third and fifth dorsal rays.* A black dot superiorly in the axil of the pectoral.

East Indian Archipelago.

a. Thirty-one lines long. From Dr. P. v. Bleeker's Collection.

15. **Platyglossus miniatus.**

Julis miniatus, (*Kuhl & v. Hass.*) *Cuv. & Val.* xiii. p. 460; *Bleek. Verhand. Batav. Genootsch.* xxii. *Bali*, p. 8, and *Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 60.
—— miniatus, pt., *Bleek. Timor*, p. 171.
Halichœres miniatus, *Bleek. Atl. Ichth.* p. 114. tab. 41. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28. L. transv. 2/9.

The height of the body is equal to the length of the head, and rather less than one-fourth of the total. Caudal rounded. Red: most of the scales along the middle of the sides with a blackish spot; six blackish spots along the back; sides of the belly with numerous crescent-shaped vertical streaks; a deep-violet spot behind the eye; a curved silvery streak from the angle of the mouth to below the orbit, bent downwards over the operculum to the interoperculum. Dorsal fin with numerous oblique, undulated violet lines, descending obliquely backwards, and generally with two black ocelli between the two anterior spines and behind the first ray; *anal dotted all over with black*; caudal rays with small red dots.

East Indian Archipelago. Coasts of Australia.

a, b. Adult and half-grown. Australia. From Mr. Macgillivray's Collection.

c. Adult. China. Presented by Vice-Admiral Sir E. Belcher, C.B.

16. Platyglossus pseudominiatus.

Julis miniatus, pt., *Bleek. Timor*, p. 171.
—— pseudominiatus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 63.
Halichœres pseudominiatus, *Bleek. Atl. Ichth.* p. 115. tab. 40. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27.

The height of the body equals the length of the head, and is one-fourth, or rather less than one-fourth, of the total. Caudal rounded. Red: most of the scales along the middle of the sides with a large blackish spot; similar spots form three or four bands across the back; there are two to four whitish streaks on the side of the belly, which descend obliquely forwards; a deep-violet spot behind the eye; a curved reddish band edged with blue runs from the snout, below the eye, to the suboperculum. Dorsal fin with numerous purplish lines, descending obliquely backwards, and with two black ocelli between the two anterior spines and behind the first ray; *anal with several oblique rosy streaks edged with blue*; caudal rays with small red dots. (*Bl.*)

East Indian Archipelago.

17. Platyglossus nebulosus.

Julis nebulosus, *Cuv. & Val.* xiii. p. 461.
—— reichei, *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Sumatra*, vi. p. 43.
Halichœres reichei, *Bleek. Atl. Ichth.* p. 116. tab. 37. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28.

The height of the body is rather less than the length of the head, and is contained four times and a third in the total. Olive (in spirits), with a rather indistinct dark band running from the opercular lobe along the middle of the side, disappearing on the tail, and emitting some short processes inferiorly and superiorly; some irregular silvery spots between these processes; *several oblique silvery transverse streaks or bands on the side of the belly*, covered by the pectoral. *About seven silvery spots on the back*, along the base of the dorsal. Head with several reddish-violet bands, that on the cheek being curved, *without forming a complete ring*. Opercular lobe dark-violet, preceded by a silvery spot. Dorsal fin with a black spot between the first and third rays, sometimes with a minute one between the first two spines, with two or three series of red, blue-edged ocelli, and with dark-violet bands, ascending obliquely forwards; anal with a series of ocelli along the base and with a band along the middle; caudal with black dots, and sometimes immaculate.

Red Sea. East Indies.

a. Adult. Red Sea. Presented by J. Burton, Esq.
b. Half-grown. Amboyna. Purchased of Mr. Frank.
c Adult. From Dr. P. v. Bleeker's Collection. (*Halichœres reichei.*)
d. Adult. From the Collection of the Zoological Society.

18. **Platyglossus pœcilus.**

Julis pœcila, *Richards. in Beech. Voy. Zool. Fish.* p. 66. pl. 19. fig. 1.
—— harloffii, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 22.
Halichœres pœcila, *Bleek. Synon. Labr.* p. 15, and *Atl. Ichth.* p. 115. tab. 39. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28.

The height of the body is rather less than the length of the head, and one-fourth of the total. Olive (in spirits), with three irregular, more or less interrupted violet longitudinal bands, the lower of which runs from above the pectoral to the middle of the root of the caudal; irregular series of silvery spots between these bands; *sides of the belly with several silvery blotches. About five silvery spots on the back*, along the base of the dorsal. Head with several reddish-violet bands, *those on the cheek and on the opercles forming complete rings.* Opercular lobe dark-violet, preceded by a silvery spot. Dorsal fin with a black spot between the first and third rays, and sometimes with a second between the first two spines, and with red ocelli; anal with a series of ocelli along the base and with a band along the middle; caudal with red ocelli.

East Indian Archipelago.

a. Adult. From Dr. P. v. Bleeker's Collection.

19. **Platyglossus kawarin.**

Julis kawarin, *Bleek. Timor*, p. 172.
Halichœres kawarin, *Bleek. Atl. Ichth.* p. 121. tab. 41. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28.

The height of the body equals the length of the head, and is one-fourth of the total. Caudal rounded. Greenish, with irregular violet spots on the back, *and with red* (in spirits white) *subreticulated spots on the side*; head with reddish-violet streaks; *a deep-blue spot behind the orbit; a black spot between the last spine and second ray of the dorsal fin*; large reddish-violet spots along the base of the anal, smaller ones on its outer portion; caudal violet posteriorly. (*Bl.*)

Coasts of Celebes and Timor.

a. Thirty-four lines long. From Dr. P. v. Bleeker's Collection.—This specimen has no spots along the base of the anal fin.

20. Platyglossus trimaculatus.

Julis trimaculata, *Quoy & Gaim. Voy. Astrol. Zool.* ii. p. 705. pl. 20. fig. 2; *Cuv. & Val.* xiii. p. 452 (not p. 386).
—— spilurus, *Bleek. Banda,* i. p. 252.
Güntheria trimaculata, *Bleek. Synon. Labr. in Versl. Akad. Wet. Amsterd.* xiii. p. 291, and *Atl. Ichth.* p. 138. tab. 32. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 29. L. transv. $\frac{2\frac{1}{2}}{9}$. Vert. 10/15.

The height of the body equals the length of the head, and is rather more than one-fourth of the total. Caudal truncated. Head with a broad bluish band from the snout, below the eye, bent downwards across the operculum and suboperculum; several other oblong spots above this band; a crescent on the interoperculum and the margin of the suboperculum bluish; an oblique white streak from the axil to the belly. Each scale with a bluish vertical streak; *a dark-brown spot near the root of the caudal, above the lateral line; sometimes one or two other brown spots on the side of the body.* Dorsal with three, anal with two longitudinal lines, which are whitish in spirits; a small black spot superiorly in the axil.

Sea of Vanicolo. East Indian Archipelago.

a, b–c, d–g. From the Haslar Collection.
h. Skeleton.

21. Platyglossus binotopsis.

Halichœres binotopsis, *Bleek. in Verhand. Batav. Genootsch.* xxii. *Bali,* p. 7; *Timor,* p. 170, and *Atl. Ichth.* p. 120. tab. 40. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 25.

The height of the body is two-ninths of the total length, the length of the head one-fourth. Caudal fin rounded. Back reticulated with blackish-violet and brownish, and with four or five darker cross-bands; head with undulated reddish-violet streaks; *tail superiorly at the base of the caudal with a black, red-edged spot; dorsal* with numerous red ocelli, and *with two black, red-edged spots,* one between the first and second spines, the other between the first and third rays; anal with yellow ocelli; caudal orange-coloured; a violet streak across the base of the pectoral.

East Indian Archipelago.

a. From Dr. P. v. Bleeker's Collection.

22. Platyglossus hœvenii.

Halichœres hœvenii, *Bleek. Banda,* i. p. 250.
Platyglossus hœvenii, pt., *Bleek. Atl. Ichth.* p. 111. tab. 42. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 28.

The height of the body is one-fourth of the total length, and nearly equal to the length of the head. Caudal rounded. Brownish: *head and body with eight or nine carmine-red longitudinal bands;* snout yellow; a bluish spot behind the orbit; fins red, dorsal and anal with violet longitudinal bands; *a round black spot between the first and third rays of the dorsal fin; a black spot superiorly in the axil.* A black ocellus on the upper part of the root of the caudal.

East Indian Archipelago.

a. Fine specimen, 3½ inches long. From Dr. P. v. Bleeker's Collection.

23. **Platyglossus chrysotænia.**

Halichœres chrysotænia, *Bleek. Batavia*, p. 488.
Platyglossus hœvenii, pt., *Bleek. Synon. Labr.* p. 11. •

D. $\frac{9}{13}$. A. $\frac{3}{13}$. L. lat. 27.

The height of the body is nearly equal to the length of the head, and one-fourth of the total. Caudal rounded. Bluish, *with ten or more golden longitudinal bands*; a small deep-blue ocellus superiorly at the base of the caudal; *dorsal with a large deep-blue ocellus between the last spine and the fourth ray; no black spot superiorly in the axil of the pectoral or behind the orbit.*

Java and Sumatra.

a. Fine specimen, 3⅓ inches long. From Dr. P. v. Bleeker's Collection.

This species appears to be very distinct from *Pl. hœvenii*; it has no axillary spot, more numerous longitudinal bands alternately narrower and broader, one more dorsal ray, &c.

24. **Platyglossus timorensis.**

Halichœres timorensis, *Bleek. Timor*, p. 171, and *Atl. Ichth.* p. 120. tab. 40. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28.

The height of the body equals the length of the head and is one-fourth of the total. Caudal fin rounded. *A very small black spot between the first and second dorsal spines and another between the first and third rays. Yellow: sides with scattered black dots, two to four being always together*; a violet spot behind the orbit, and another superiorly at the root of the caudal. Dorsal with oblique red streaks; anal with reddish-violet spots along the base. (*Bl.*)

Coast of Timor.

25. **Platyglossus notopsis.**

Julis notopsis, (*Kuhl & v. Hass.*); *Bleek. Sumatra*, ii. p. 290, and *Natuurk. Tydschr. Nederl. Ind.* ii. 1851, pl. 1.
? Julis notopsis, *Cuv. & Val.* xiii. p. 485.
Julis phaiopus, *Bleek. Sumatra*, ii. p. 291.
Platyglossus notopsis, *Bleek. Synon. Labr.* p. 11, and *Atl. Ichth.* p. 111. tab. 41. figs. 1 & 2.

D. $\frac{9}{13}$. A. $\frac{3}{12}$. L. lat. 27.

The height of the body is contained thrice and two-thirds in the total length, the length of the head four times and a half. Caudal rounded. Brown, with four or five red longitudinal bands. (Three round yellow spots above the lateral line and several silvery lines along the side in young age.) Dorsal and anal fins brownish-violet with series of red spots, the former with *two black ocelli: one is small, between the first and second spines, the other very large, between the first and sixth rays; base of the pectoral with a blue cross-band.* Caudal yellow at the base and margins.

Java, Sumatra, and Batu.

a, b. Adult and young. From Dr. P. v. Bleeker's Collection.

26. Platyglossus solorensis.

Julis solorensis, *Bleek. Solor,* p. 86.
Halichœres solorensis, *Bleek. Atl. Ichth.* p. 116. tab. 40. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 26.

The height of the body is contained four times and three-fourths in the total length, the length of the head four times and a half. Caudal rounded. Violet-olive, sides of the head with reddish-violet longitudinal bands. Dorsal fin yellow anteriorly, with the margin red; *a black spot between the first and third spines, and another between the fifth and sixth rays;* anal with indistinct spots and brown margin; caudal with a small black spot superiorly at the base; pectoral with a deep-blue band across the base. (*Bl.*)

Coasts of Solor and Amboyna.

27. Platyglossus prosopeion.

Julis prosopeion, *Bleek. Amboina,* iv. p. 347.
Halichœres prosopeion, *Bleek. Atl. Ichth.* p. 122. tab. 37. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27. L. transv. $\frac{2\frac{1}{2}}{10}$.

The height of the body is contained four times and a quarter in the total length, the length of the head four times and two-thirds. Caudal rounded. The first ventral ray prolonged. *A large black spot between the first and fourth dorsal spines,* bluish longitudinal lines behind; vertical fins yellow: dorsal blue-edged; anal with three bluish longitudinal streaks; *pectoral with a triangular blackish band across the base.*

Sea of Amboyna.

a. Not good state. From Dr. P. v. Bleeker's Collection.
b. Fine specimen. Amboyna. Purchased of Mr. Frank.—The bluish lines of the dorsal and anal fins become very indistinct in preserved specimens.

28. Platyglossus guttatus.

Prochilus, sp., *Klein, Miss. Pisc.* v. tab. 12. fig. 5.
Labrus guttatus, *Bl.* tab. 287. fig. 2; *Bl. Schn.* p. 247.
? Labrus argus, *Bl. Schn.* p. 263.
Julis argus, *Benn. Zool. Journ.* iii. p. 577. pl. 13. fig. 7.
—— polyophthalmus, *Bleek. Banka,* ii. p. 731.

Halichœres guttatus, *Bleek. Synon. Labr.* p. 13, and *Atl. Ichth.* p. 124. tab. 35. fig. 1.

D. $\frac{9}{13}$. A. $\frac{3}{12}$. L. lat. 26.

The height of the body is a little more than the length of the head, and two-ninths of the total; caudal fin rounded. Body dark reddish-violet, with a brown band from the head to the caudal, above the lateral line; a series of four or five light spots on the back; *sides with seven series of red, blue-edged ocelli*; head with reddish-violet bands. Dorsal and anal fins with two or three series of red, blue-edged ocelli, which are partly confluent, forming bands; caudal with bluish rings, blackish posteriorly, the angles being yellow.

East Indian Archipelago.

a. Adult. Sumatra. From Sir T. S. Raffles's Collection.—Type of *Julis argus*, Benn.
b. Half-grown. Ceram. Purchased of Mr. Frank.
c. Fine specimen. Chusan. From Dr. Cantor's Collection.

29. **Platyglossus amboinensis.**

Julis amboinensis, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina.* p. 55.
Halichœres amboinensis, *Bleek. Atl. Ichth.* p. 122. tab. 37. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27–28.

The height of the body is contained four times and a fifth in the total length, the length of the head four times and a half. Caudal rounded; the first ventral ray produced. *Crown of the head and nape with series of reddish-violet spots.* Head with three longitudinal, thorax with two oblique reddish-violet bands. *A bluish-black spot between the first and third dorsal spines*; anal immaculate, and, like the dorsal, edged with blue. Caudal with five or six rose-coloured transverse stripes, violet posteriorly. Pectoral with a violet and red streak across the base.

Amboyna.

30. **Platyglossus leparensis.**

Julis leparensis, *Bleek. Banka,* ii. p. 730.
Halichœres leparensis, *Bleek. Atl. Ichth.* p. 119. tab. 42. fig. 5.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 26.

The height of the body is contained four times and a half to four times and three-fourths in the total length, the length of the head four times. Caudal rounded. *Dorsal fin with two black ocelli,* one between the two first spines, the other between the two first rays; *a third black, red-edged ocellus posteriorly and superiorly on the tail.* Most of the scales on the back with a brown spot; *six well-defined silvery lines along the sides,* the upper of which runs from the eye to the caudal fin. A broad brown streak from the eye to the maxillary; a brown spot behind the eye; operculum with four curved yellowish stripes superiorly. Caudal fin red.

East Indian Archipelago.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

31. Platyglossus modestus.

Julis modestus, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 26.
Halichœres modestus, *Bleek. Versl. Akad. Wet. Amsterd.* xiii. p. 287, and *Atl. Ichth.* p. 126. tab. 35. fig. 2.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28. L. transv. 3/10.

The height of the body is contained four times in the total length, the length of the head three times and two-thirds. Caudal rounded; dorsal spines pungent. *A large black blotch on the middle of the sides; back with longitudinal series of very small black dots.* A bluish-black spot behind the eye; an undulated whitish band from the angle of the mouth, below the eye, to the operculum; root of the pectoral with a black transverse streak.

East Indian Archipelago.

a–c. Fine specimens. Singapore.

32. Platyglossus bimaculatus.

Halichœres bimaculatus, *Rüpp. N. W. Fische,* p. 17. taf. 5. fig. 2.
Julis bimaculatus, *Cuv. & Val.* xiii. p. 490.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27. L. transv. 2/10.

The height of the body equals the length of the head and is one-fourth of the total. Caudal truncated. *A black spot on the ninth and tenth scales of the lateral line.* Green, with a blue longitudinal band running from the operculum across the bend of the lateral line to the upper part of the base of the caudal. Head with light-violet bands radiating from the eye.

Var. α. Dorsal and anal with the inner half reddish-violet and with a series of blue dots along the base, the outer half with red, black, blue and green longitudinal bands; caudal spotted with bluish. —Red Sea.

Var. β. Dorsal with two longitudinal, caudal with three transverse series of ocelli.—Ceylon.

a–b. Adult: stuffed: not good state. Ceylon. From Dr. Kelaart's Collection.

33. Platyglossus hartzfeldii.

Julis hartzfeldii, *Bleek. Amboina,* ii. p. 563.
Halichœres hartzfeldii, *Bleek. Atl. Ichth.* p. 123. tab. 35. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27.

The height of the body is contained four times and two-thirds in the total length, the length of the head three times and three-fourths. Caudal subtruncated. Head green, with reddish-violet bands. *Body with a broad purple longitudinal band,* edged with blue, running from the operculum to the caudal fin, and sometimes marked with one or two black dots behind the dorsal; an oblique reddish-violet band from the base of the pectoral to the belly; *a large violet spot on the side,* covered by the end of the pectoral. Dorsal fin reddish-violet below, yellow above with a blue longitudinal stripe; blue ocelli between the single soft rays at their base. Anal fin with a blue stripe and violet margin; caudal yellow, with three transverse series of reddish-violet spots; a black spot superiorly in the axil.

Celebes, Ternate, Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

34. Platyglossus purpurascens.

Seba, iii. p. 95. tab. 31. fig. 6.
Labrus, sp., *Gronov. Mus. Ichth.* ii. p. 28. no. 183, and *Zoophyl.* no. 240.
—— purpurescens, *Bl. Schn.* p. 262.
—— leucurus, *Bl. Schn.* p. 259.
Julis temminckii, *Bleek. Batav.* p. 491.
—— kallopisos, *Bleek. Nat. Tydschr. Nederl. Ind.* iv. p. 491 & v. p. 348.
Platyglossus purpurescens, *Bleek. Synon. Labr.* p. 11, and *Atl. Ichth.* p. 108. tab. 45. fig. 1.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27.

The height of the body equals the length of the head and is one-fourth of the total. Caudal rounded. Green: each scale with a red spot; head with red bands; dorsal and anal with numerous oblique red stripes, and with a yellow, blue, black and red margin; a deep-blue and bright-yellow spot superiorly in the axil; caudal violet, with numerous red vertical streaks, the angles being broadly margined with yellow and blue.

Java, Banka, Celebes, and Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

35. Platyglossus ceylonicus.

Julis ceylonicus, *Benn. Proc. Comm. Zool. Soc.* ii. 1832, p. 183.

The typical specimen of this species appears to be lost, nor has the species been recognized, so that we are obliged to repeat Bennett's description:—

D. $\frac{9}{11}$. A. $\frac{3}{11}$.

Caudal rounded; a posterior canine tooth. Yellowish: head grey, rivulated with yellow; a yellow interrupted band along the lateral line; another lateral band of the same colour, edged with blue, runs along the side and emits numerous short processes towards the belly; an oblique yellow streak across the base of the pectoral to the belly; vertical fins yellow: a band along the base of the dorsal edged with blue inferiorly; an oblique blue streak behind the base of each dorsal ray, a second behind its middle, and a spot of the same colour behind its top; anal fin with two blue bands; caudal with three irregular, transverse, rivulated blue lines.

Ceylon.

36. Platyglossus pardaleocephalus.

Julis pardaleocephalus, *Bleek. Verh. Batav. Genootsch.* xxii. *Bali*, p. 8.
Halichœres pardaleocephalus, *Bleek. Atl. Ichth.* p. 123. tab. 35. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28.

The height of the body equals the length of the head and is one-fourth of the total. Caudal truncated. Violet, each scale with a green crescent; head with blue streaks and spots. Vertical fins greenish, with numerous ocelli; *a blackish spot at the base between the two first dorsal spines. Pectoral without a dark band across the base.*

Sumatra and Bali.

a. From Dr. P. v. Bleeker's Collection.

37. **Platyglossus kallochroma.**

Julis kallochroma, *Bleek. Sumatra*, ii. p. 289.
Platyglossus kallochroma, *Bleek. Syn. Labr.* p. 11, and *Atl. Ichth.* p. 108. tab. 42. fig. 4.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 26.

The height of the body is a little less than one-fourth of the total length the length of the head two-ninths. Caudal fin rounded. Head reddish-violet, with blue bands and spots; *body red, with about ten violet, blue-edged stripes*; vertical fins brownish-violet, with numerous small blue spots: dorsal and anal edged with yellow and blue; anal with two yellow, blue-edged bands besides, one along the base, and the other along the middle; *angles of the caudal yellow*, the yellow part being edged with blue interiorly. Pectoral red, *with a violet streak across the base.*

Sumatra, Nias.

a. From Dr. P. v. Bleeker's Collection.

38. **Platyglossus vrolikii.**

Julis vrolikii, *Bleek. Batoe*, p. 323.
Platyglossus vrolikii, *Bleek. Syn. Labr.* p. 12, and *Atl. Ichth.* p. 110. tab. 42. fig. 2.

D. $\frac{9}{12}$. A $\frac{3}{12}$. L. lat. 28.

The height of the body is contained four times or four times and a quarter in the total length, the length of the head four times and a half. Caudal rounded; the first ventral ray produced. Head yellow, with reddish-violet bands edged with darker: one from the snout to the eye, a second curved from below the eye to the suboperculum, two parallel ones behind the eye united by a transverse spot, a fourth on the snout and forehead, and a fifth transverse one on the membrane of the operculum. Anterior portion of the back with six to eight reddish-violet longitudinal bands, formed by confluent spots; *posterior part of the back with four yellow cross-bars* edged with violet, and scarcely extending below the lateral line; each scale on the sides with a violet transverse spot; *dorsal fin with three series of red, blue-edged ocelli and with a blue intramarginal line*; anal with two or three undulated red, blue-edged bands and with a blue intramarginal line; caudal with similar ocelli as the dorsal; *pectoral with a black spot superiorly at the base*; a black ocellus superiorly at the root of the caudal fin.

Batu, Nias, Banka.

a. From Dr. P. v. Bleeker's Collection.

39. **Platyglossus podostigma.**

Julis podostigma, *Bleek. Floris*, p. 332.
Halichœres podostigma, *Bleek. Syn. Labr. in Versl. Akad. Wet. Amsterd.* xiii. p. 288, and *Atl. Ichth.* p. 126. tab. 32. fig. 4.

D. $\frac{9}{11-12}$. A. $\frac{3}{12}$. L. lat. 27.

The height of the body is equal to, or somewhat less than, the length of the head, and one-fourth of the total. Caudal rounded. Head and thorax yellow, caudal fin reddish, body violet; head with red streaks edged with blue (during life). Ventral with a black, blue-edged spot on the middle in the young; a black oblong spot behind the axil of the pectoral, and another on its base; dorsal and anal fins with blue margins, and with numerous oblique reddish stripes or spots; *caudal immaculate.*

Coasts of Floris, Booroo, and Amboyna.

a. From Dr. P. v. Bleeker's Collection.

40. **Platyglossus marginatus.**

? Platyglossus, no. 1, *Klein, Pisc. Miss.* iv. p. 40. tab. 12. fig. 5.
Halichœres marginatus, *Rüpp. N. W. Fische*, p. 16.
Julis marginata, *Cuv. & Val.* xiii. p. 490.
Julis annularis, (*Kuhl & v. Hass.*) *Cuv. & Val.* xiii. p. 482; *Bleek. Natuurk. Tydschr. Nederl. Ind.* v. 1853, p. 513, ii. 1851, pl. 2 (incorrect).
Platyglossus annularis, *Bleek. Proc. Zool. Soc.* 1861, p. 411.
—— marginatus, *Bleek. Syn. Labr.* p. 10, and *Atl. Ichth.* p. 109. tab. 41. fig. 3.

D. $\frac{9}{13}$. A. $\frac{3}{11}$. L. lat. 27. L. transv. 3/10.

The height of the body is contained three times and a half in the total length, the length of the head four times and a half. Caudal rounded; the first ventral ray prolonged. Blackish-green; head and anterior part of the body with undulated light-green streaks, edged with blue. Vertical fins with numerous red ocelli and streaks, each edged with blue. *A large green crescent-shaped spot on the basal half of the caudal.* Vertical fins with a blue margin.

Red Sea. Mauritius. Ceylon. East Indian Archipelago.

a. Adult: stuffed. Mauritius. From Dr. Janvier's Collection.
b. Adult: skin. Ceylon. From Dr. Kelaart's Collection.
c. Young. From Dr. P. v. Bleeker's Collection.

41. **Platyglossus notophthalmus.**

Tautoga notophthalmus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado & Macassar*, p. 53.
Hemitautoga notophthalmus, *Bleek. Versl. Akad. Wet. Amst.* xiii. p. 292, and *Atl. Ichth.* p. 140. tab. 21. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27.

A posterior canine tooth; some small scales behind the eye; opercles naked. The height of the body is contained four times and a third in the total length; snout pointed; cleft of the mouth narrow. Body with three very broad, rather irregular brown cross-bands, the middle of which extends over the dorsal fin, between the fifth spine and the fifth ray; a large yellow ring between the eighth spine and the fifth ray of the dorsal fin; caudal yellow. (*Bl.*)

Coasts of Java, Celebes, Goram, Timor, and New Guinea.

a. Twenty lines long: not good state. From Dr. P. v. Bleeker's Collection.

42. Platyglossus tenuispinis.

D. $\frac{9}{12-13}$. A. $\frac{2}{12}$. L. lat. 29. L. transv. 2/9.

The height of the body equals the length of the head and is two-ninths of the total. A posterior canine tooth. *Dorsal spines slender*, flexible, as long as the rays; caudal rounded; ventral not produced, a little shorter than the pectoral. *Colours in spirits*: uniform reddish-olive; fins whitish; a large black blotch between the first and third dorsal spines; a black spot superiorly in the axil.

Seas of China.

a, *b*, *c*. Sixty-two lines long.

43. Platyglossus semicinctus.

Julis semicinctus, *Ayres, Proc. Calif. Acad.* 1859, p. 32.

D. $\frac{9}{11}$. A. $\frac{2}{12}$.

The height of the body equals the length of the head, and is not quite one-fourth of the total. Dark greenish-olive, with a broad black band arising on the side, at about the middle of the body in height, and passing down to join, on the abdomen, the corresponding band from the opposite side: this band is overlaid by the pectoral fin. Dorsal and anal fins dusky. Caudal with numerous, narrow, vertical, waving darker and lighter streaks. (*Ayres.*)

Cerros Island (coast of Lower California).

44. Platyglossus cyanostigma.

Julis cyanostigma, *Cuv. & Val.* xiii. p. 391.
—— patatus, pt. (deux autres, long de treize pouces, &c.), *Cuv. & Val.* xiii. p. 399.

D. $\frac{9}{11}$. A. $\frac{3}{12}$. L. lat. 28. L. transv. $\frac{2\frac{1}{2}}{10}$.

The height of the body is contained three times and a half in the total length, the length of the head four times. Caudal truncated. Reddish-olive (in spirits), each scale on the tail and along the lateral line with a blue spot; two indistinct light bands along the body; head with irregular blue lines, several of which ascend towards the nape of the neck. A black spot superiorly in the axil of the pectoral. Back with three blackish blotches; the middle is the darkest, and situated below and on the anterior part of the soft dorsal; large silvery spots between the black ones. Dorsal fin with irregular blue spots and with blue margin; anal with a series of blue ocelli along the base and with blue margin, a band and a series of spots of the same colour running along the middle; caudal with numerous dots, and with the upper and lower margins blue; the upper part of the extremity of the pectoral blackish. *Young* specimens with a black spot on the root of the caudal.

Caribbean Sea.

a. Fine specimen, ten inches long. Cuba. From the Collection of the Zoological Society.
b–c. Adult and young: skins. Jamaica. From Dr. Parnell's Collection.
d–f. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
g. Adult: has been in chloride of zinc. From the Haslar Collection.
h–i. Eighteen inches long: stuffed.

45. **Platyglossus garnoti.**

Julis garnoti, *Cuv. & Val.* xiii. p. 390.

$D.\frac{9}{11}.\quad A.\frac{3}{11}.$

Similar to *P. cyanostigma.*

Caudal rounded. Three or four fine blackish lines ascend from the eye towards the neck. Bluish or greenish, back red: the spinous dorsal bluish-black; the soft lighter, with red spots along the base; anal with a series of blue dots near the base; caudal with ten cross-bands alternately wider and narrower. (*Val.*)

Martinique.

46. **Platyglossus ruptus.**

? Julis patatus, pt. (l'individu à plus de quinze pouces), *Cuv. & Val.* xiii. pp. 398 & 399.
Julis rupta, *Poey, Mem. Cub.* ii. p. 212.

$D.\frac{9}{11}.\quad A.\frac{3}{12}.\quad$ L. lat. 28. L. transv. $\frac{2\frac{1}{2}}{9}$.

The height of the body is contained four times and a third in the total length, the length of the head four times. Caudal slightly rounded. Upper parts greenish: a dark-brown band descends from the back towards the vent, and sometimes occupies the back of the tail below the soft dorsal. Two black lines ascend from the eye to the nape of the neck; neck and anterior part of the dorsal with black dots; the soft dorsal with numerous oblique brown streaks; caudal with five, anal with two blue bands.

Caribbean Sea.

a. Fine specimen. Cuba. From the Collection of the Zoological Society.
b. Adult: skin. Jamaica. From Dr. Parnell's Collection.

47. Platyglossus cinctus.

Julis cincta, *Poey, Mem. Cub.* ii. 1860, p. 211.

D. $\frac{9}{11}$. A. $\frac{3}{12}$.

The height of the body is somewhat less than the length of the head, or than one-fourth of the total; caudal rounded. Back greenish anteriorly, reddish posteriorly; a broad violet band descends from the back to the vent. Two blue lines ascend from the eye towards the nape; the soft dorsal nearly uniform; anal reddish, with blue margin; caudal with five blue cross-bands edged with red. (*Poey.*)

Cuba.

Probably merely a variety of *P. ruptus.*

In the last part of Poey's Memor. Cub. p. 354, published in 1861, the author considers it possible that *Pl. ruptus* and *Pl. cinctus* are the two sexes of one species.

48. Platyglossus opalinus.

Julis opalina, *Cuv. & Val.* xiii. p. 392.

D. $\frac{9}{11}$. A. $\frac{3}{12}$. L. lat. 25. L. transv. 2/9.

The height of the body is one-third of the total length; the anterior profile of the snout forms two-thirds of a right angle with a horizontal line; nape of the neck arched. Caudal truncated. Bluish, iridescent: head with blue lines; dorsal blue; anal with two violet streaks; caudal striped with violet. (*Val.*)

Martinique.

The specimen on which this species has been founded is fifteen inches long.

49. Platyglossus crotaphus.

Julis crotaphus, *Cuv. & Val.* xiii. p. 395.

D. $\frac{9}{11}$. A. $\frac{3}{12}$. L. lat. 29. L. transv. 2/8.

The height of the body is nearly equal to the length of the head, and contained four times and a third in the total. Caudal truncated. A dark spot behind the orbit. Green: head and caudal with red streaks; dorsal red; anal with a band along the middle.

Atlantic coasts of Tropical America.

a. Adult. Brazil. Presented by Lord Stuart.
b. Fine specimen. Bahia. From Dr. O. Wucherer's Collection.
c. Adult: stuffed. Bahia.
d. Adult. Bahia. Purchased of M. Parzudaki.
e. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
f. Half-grown. Caribbean Sea. From the Collection of the Zoological Society.

50. Platyglossus principis.

Pudiano verde, *Marcgr.* p. 146.
Turdus, etc., *Catesb. Hist. Carol.* pl. 12[*].
Doncella, *Parra*, p. 95. lam. 37. fig. 1.
? Labrus brasiliensis, *Bl.* taf. 280; *Bl. Schn.* p. 242.
Julis principis, *Cuv. & Val.* xiii. p. 402.

D. $\frac{9}{11}$. A. $\frac{3}{12}$. L. lat. 25.

The height of the body is contained three times and two-thirds in the total length, the length of the head four times. Caudal truncated. Body without apparent markings; head with blue bands; dorsal and anal fins blue-edged, the latter with two violet bands; the soft dorsal and the caudal with irregular and interrupted bands of the same colour. (*Val.*)

Atlantic coasts of tropical America.

51. Platyglossus internasalis.

? Julis dimidiatus, *Agass. in Spix, Pisc. Bras.* p. 96. pl. 53 (the streak on the temple is omitted); *Cuv. & Val.* xiii. p. 407.
Julis internasalis, *Poey, Mem. Cub.* ii. 1861, p. 421.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 25. L. transv. 2/9.

The height of the body is contained three times and three-fourths in the total length, the length of the head four times. Caudal slightly rounded. Brownish-olive (in spirits), with a broad brownish band from the operculum along the upper half of the sides. An oblique bluish streak, edged with brown, ascends from the eye towards the nape. Basal half of the dorsal blackish; a fine black line runs along the margin of the fin.

Coast of Brazil. Caribbean Sea.

a, b. Fine specimens. Cuba. From the Collection of the Zoological Society.

52. Platyglossus bivittatus.

Labrus bivittatus, *Bl.* taf. 284. fig. 1.
—— psittaculus, *Lacép.* iii. p. 522.
Julis psittaculus, *Cuv. & Val.* xiii. p. 387.

D. $\frac{9}{11}$. A. $\frac{3}{12}$. L. lat. 27. L. transv. $\frac{1\frac{1}{2}}{9}$.

The height of the body is nearly equal to the length of the head, and one-fourth of the total. Caudal truncated. A dark-brown spot, edged with bluish-white posteriorly, on the operculum; *a brown band runs from the snout*, through the eye and the opercular spot, across the bend of the lateral line *to the base of the caudal*; sometimes another similar band, which is less distinct, along the side of the belly; a bluish streak edged with darker ascends from the eye, obliquely upwards and backwards, to meet its fellow on the nape of the neck; base of the pectoral whitish, without black spot; *base of the dorsal fin violet, two or three narrow lines along its upper half*; caudal with three curved concentric lines and with the corners brownish.

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[*] This figure is quoted by Linné for his *Sparus radiatus*; but this is a different fish, which had been sent to him by his friend Garden from North America. Bloch's *Sparus radiatus*, again, is different, namely a species of *Cheilinus*.

Atlantic coasts of tropical America.

a–f. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
g. Young. Jamaica. From Mr. Gosse's Collection.
h, i. Adult. Puerto Cabello. Purchased of Mr. Brandt.
k, l, m. Adult and half-grown.

53. Platyglossus humeralis.

Julis humeralis, *Poey, Mem. Cub.* ii. p. 212.

D. $\frac{9}{11}$. A. $\frac{3}{12}$. L. lat. 27. L. transv. 2/9.

The height of the body is one-fifth of the total length, the length of the head two-ninths. Caudal truncated. A black spot, edged with pearl-colour posteriorly, on the extremity of the operculum. *A brown band runs from the snout*, through the eye and the opercular spot, across the bend of the lateral line *to the base of the caudal; a second from below the axil along the side of the belly*; a bluish streak edged with darker ascends from the eye, obliquely upwards and backwards, to meet its fellow on the nape of the neck; base of the pectoral whitish, without black spot; *a black band along the middle of the dorsal*; caudal with blue corners.

Coast of Cuba.

a. Adult. From Mr. Stoke's Collection.

54. Platyglossus maculipinna.

Julis maculipinna, *Müll. & Trosch. Hist. Barbad.* p. 674.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 28. L. transv. 2/9.

Caudal rounded. *Dorsal fin with a black spot between the fifth and seventh spines*, and with a band along the middle of the soft portion; a small black spot posteriorly in the axil of the dorsal; *a broad dark band runs from the head to the caudal fin*, below the lateral line; sometimes a dark spot below the band on the middle of the body; a blue band from the snout through the eye to the operculum, and another above it from the snout to the eye; both bands are united, forming a V. Three bluish bands across the nape, and three white ones on the cheek. Base of the pectoral with a small black spot.

Caribbean Sea.

a. Half-grown.
b–d. Adult and half-grown: skins. West Indies.
e. Half-grown: skin. Trinidad. Presented by J. B. Richardson, Esq.

55. Platyglossus caudalis.

Julis caudalis, *Poey, Mem. Cub.* ii. p. 213.

The height of the body is two-ninths of the total length; the diameter of the eye is one-sixth of the length of the head. *Caudal convex in the middle, with the lobes produced,* the upper being the longer. Body greenish; head with blue streaks, extending on the base of the pectoral and on the throat; *a green, blue-edged spot behind the eye.* Two series of blue spots proceed from the caudal towards the middle of the trunk. Dorsal and anal rosy, with two blue stripes which are formed by spots on the dorsal. (*Poey.*)

Cuba.

56. Platyglossus pictus.

Julis picta, *Poey, Mem. Cub.* ii. p. 214.

D. $\frac{9}{10}$. A. $\frac{3}{12}$.

The height of the body is two-elevenths of the total length, the length of the head one-fourth; snout pointed. *Caudal convex in the middle, with the lobes produced.* Red anteriorly, greenish-olive posteriorly; head with blue bands; dorsal and anal fins orange-coloured, the latter with two blue longitudinal lines; caudal with three yellow bands, the middle being longitudinal, and the outer ones oblique. (*Poey.*)

Cuba.

57. Platyglossus pyrrhogramma.

Julis pyrrhogramma, *Schleg. Faun. Japon. Poiss.* p. 170. pl. 86 bis, fig. 2.

D. $\frac{9}{14}$. A. $\frac{3}{14}$. L. lat. 28.

The height of the body is contained four times and three-fourths in the total length, the length of the head four times and one-fourth. Caudal fin rounded. *A rather narrow brown band runs from the end of the snout, through the eye and the opercular lobe, to the base of the caudal; no lateral spot.* A similar band on the back, along the base of the dorsal, joining its fellow on the head, where both form a point, extending to the snout. (*Schleg.*)

Sea of Japan.

58. Platyglossus pœcilopterus.

Julis pœcilopterus, *Schleg. Faun. Japon. Poiss.* p. 169. pl. 86 bis, fig. 1; *Richards. Ichth. Chin.* p. 260.
—— thersites, *Richards. l. c.* (deformed).

D. $\frac{9}{14}$. A. $\frac{3}{14}$. L. lat. 28. L. transv. 2/8.

The height of the body is contained four times and three-fourths in the total length, the length of the head four times and one-fourth. Caudal fin rounded. *A black blotch below the lateral line,* in the vertical from the sixth and seventh dorsal spines, *traversed by a brown longitudinal band* running from the end of the snout through the eye to the base of the caudal; a red streak from the angle of the mouth to the suboperculum; the space between the brown band and red streak is bluish, dotted with red; dorsal and anal fins with a bluish longitudinal band, and with three or two series of red spots; caudal fin with interrupted red transverse lines.

Japanese and Chinese Seas.

a. Adult: mounted. China Presented by J. R. Reeves, Esq.

29. LEPTOJULIS.

Leptojulis, *Bleek. Proc. Zool. Soc.* 1861, p. 412.

Body compressed, slender, covered with scales of moderate size (L. lat. less than 30); head naked; lateral line not interrupted; scales on the thorax smaller than those on the body. Four anterior canine teeth in each jaw, the outer enlarged, bent outwards and backwards; a posterior canine tooth. Dorsal spines nine.

East Indian Archipelago.

1. Leptojulis cyanopleura.

Bleeker, Batavia, p. 489, and *Atl. Ichth.* p. 128. tab. 36. fig. 5.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27. L. transv. $2\frac{1}{2}/9$.

The height of the body is one-fifth or rather less than one-fifth of the total length, the length of the head one-fourth. Caudal rounded. Green, with a broad red, blue-edged band running from the snout to the caudal; a large deep-blue blotch behind the pectoral and below the lateral line; head with two red, blue-edged bands along its lower side; a forked blue spot before the dorsal fin; the soft dorsal with blue margin, with a red band along the middle and with a basal series of red spots; anal blue-edged.

Sea of Batavia.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

2. Leptojulis pyrrhogrammatoides.

Bleeker, Batavia, p. 490, and *Atl. Ichth.* p. 129. tab. 36. fig. 1.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27. L. transv. $2\frac{1}{2}/10$.

The height of the body is contained five times in the total length, the length of the head four times and two-thirds. Caudal rounded. Green, with two broad brownish bands, the one along the back, and the other from the eye to the caudal; anal with yellow spots along the base; the other fins immaculate. Nearly uniform brownish (in spirits).

Sea of Batavia.

a. From Dr. P. v. Bleeker's Collection.

30. PSEUDOJULIS.

Pseudojulis, *Bleek. Proc. Zool. Soc.* 1861, p. 412.

Body compressed, slender, covered with scales of moderate size (L. lat. less than 30); head naked; lateral line not interrupted; scales on the thorax smaller than those of the body. No posterior canine tooth; anterior teeth conical. Dorsal spines nine.

East Indian Archipelago. Coasts of California.

1. Pseudojulis girardi.

Julis girardi, *Bleek. Bali,* iii. p. 168.
Pseudojulis girardi, *Bleek. Proc. Zool. Soc.* 1861, p. 412, and *Atl. Ichth.* p. 127. tab. 33. fig. 3.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 27.

The height of the body is contained five times in the total length, the length of the head four times and a third or four times and a fourth. Caudal rounded; dorsal spines pungent. Greenish-rose-coloured: snout and forehead amber-brown; a broad brownish band from the forehead to the operculum and from thence to the caudal; pectoral with a blackish spot superiorly in the axil; fins rose-coloured. (*Bl.*)

Coast of Boleling.

2. Pseudojulis modestus.

Julis modestus, *Girard in U. S. Pacif. R. R. Exped. Fishes,* p. 163; *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 142.

D. $\frac{9}{13}$*. A. $\frac{3}{13}$. L. lat. 28.

The height of the body is contained five times and two-thirds in the total length, the length of the head four times and a half. Dorsal spines slender, slightly flexible; caudal fin subtruncated. Brownish-olive; a pair of dark spots at the root of the caudal, and a blackish spot superiorly in the axil of the pectoral.

Coasts of California.

a. Fine specimen. San Diego. Presented by the Smithsonian Institution.

31. NOVACULA †.

Xyrichthys, sp., *Cuv. & Val.* xiv. p. 33.
Novacula, *Cuv. & Val.* xiv. p. 64.
Novacula, sp., *Steindachner in Verhandl. Zool. Bot. Gesellsch. Wien,* 1861, p. 133.

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* Nine dorsal spines are very distinct.

† 1. Xyrichthys vitta, *Cuv. & Val.* xiv. p. 51.—*Hab.*——?
2. Novacula tessellata, *Cuv. & Val.* xiv. p. 74.—Mauritius.
3. —— immaculata, *Cuv. & Val.* xiv. p. 75.—Mauritius.

Novacula, Xyrichthys, Hemipteronotus, et Novaculichthys, *Bleek. Proc. Zool. Soc.* 1861, p. 414.
Novacula, Iniistius, Xirichthys, et Malacocentrus, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 143.

Body compressed, oblong, covered with scales of moderate size; head compressed, more or less elevated and obtuse, with the upper profile generally more or less parabolic; head nearly entirely naked, or with small scales on the cheek; lateral line interrupted. No posterior canine tooth. Formula of the fins: D. $\frac{9}{12}$. A. $\frac{3}{12}$; the two anterior dorsal spines sometimes remote or separate from the others.

Seas between the tropics, extending northwards to the Mediterranean and the Japanese and Californian Seas, southwards to the Cape of Good Hope and Australia.

The length and position of the two anterior dorsal spines, some slight differences in the position of the ventral fins, the presence or absence of scales on the cheeks, and, finally, the form of the upper profile of the head, have been used as generic characters; but as each of these characters stands alone, and as the transitions between the extreme forms are very numerous, I am inclined to leave these fishes together in one genus. It is true that there is, apparently, a considerable external difference between *N. cultrata* and *N. macrolepidota*, but *N. tæniurus* and *N. altivelis* are intermediate between both.

The species may be divided as follows:—

A. Cheek scaleless[*]; no anterior division of the dorsal fin: *Xirichthys* et *Malacocentrus*, Gill.
  a. Upper edge of the head sharp: *Novacula*, Bleek., p. 169.
  b. Upper edge of the head rather obtuse: *Novaculichthys*, pt., Bleek., p. 172.
B. Cheek with two or three series of scales; no anterior division of the dorsal fin: *Novaculichthys*, pt., Bleek., p. 174.
C. Cheek scaly; no anterior division of the dorsal fin, p. 174.
D. Cheek scaleless; the two anterior dorsal spines form a more or less separate division: *Iniistius*, Gill.
  a. Upper edge of the head sharp: *Xirichthys*, Bleek., p. 175.
  b. Upper edge of the head rather obtuse: *Novaculichthys*, pt., Bleek., p. 176.
E. Cheek scaly; the two anterior dorsal spines form a more or less separate division: *Hemipteronotus*, Bleek. = *Novacula*, Gill, p. 177.

A. Cheek scaleless; no anterior division of the dorsal fin.

a. Upper edge of the head sharp.

1. Novacula cultrata.

Novacula, *Plin.* xxxii. c. 2; *Rondel.* v. c. 17. p. 146; *Gesner*, pp. 628, 629 & 721, and *Paralip.* p. 24; *Willughb.* p. 214. pl. O. 2; *Ray*, p. 101.

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[*] This expression does not exclude those species which have a few rudimentary scales behind or immediately below the orbit.

Pecten romæ, *Aldrov.* ii. c. 27. p. 205; *Jonst.* i. tit. 3. c. 1. a. 15.
Pesce pettine, *Salv.* fol. 217.
Coryphæna, no. 2, *Art. Gen.* p. 15, and *Synon.* p. 29.
Coryphæna novacula, *L. Syst.* i. p. 447; *Bl. Schn.* p. 295; *Lacép.* iii. p. 203; *Shaw, Zool.* iv. p. 217; *Risso, Ichth. Nice,* p. 181 (not *Eur. Mérid.*).
Xyrichthys cultratus, *Cuv. & Val.* xiv. p. 37. pl. 391.
? Xyrichthys vermiculatus, *Poey, Mem. Cub.* ii. p. 215.
Xyrichthys novacula, *Cuv. Règne Anim. Ill. Poiss.* pl. 89. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 27. L. transv. 2/8. Vert. 9/16.

A few rudimentary scales below the orbit; the two first dorsal spines are a little flexible; ventral fins slightly produced. Rose-coloured, each scale with a bluish vertical streak; head with rather numerous blue vertical lines; anal with oblique, caudal with vertical undulated lines. A silvery blotch on the side of the belly, frequently disappearing in specimens preserved in spirits.

From the Mediterranean to the Atlantic coasts of tropical America.

a, b. Half-grown. Mediterranean.
c, d. Half-grown. Bay of Naples.
e. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
f. Half-grown. Lanzarote. Presented by the Rev. R. T. Lowe.
g. Half-grown: skin. Caribbean Sea. From Dr. Parnell's Collection.
h. Very fine specimen. Bahia. From Dr. O. Wucherer's Collection.
i, k. Adult.
? *l.* Adult: stuffed. South Africa.

2. Novacula argentimaculata.

Xyrichthys argenti-maculata, *Steindachner, Zool. Bot. Gesellsch. Wien,* 1861, p. 134.

D. $\frac{9}{12}$. A. $\frac{3}{12}$.

Some small scales below the orbit; the two first dorsal spines are flexible, not produced and continuous with the remainder of the fin. A large roundish silvery spot on the side of the body above the level of the pectoral fin, with a small black spot in the centre; each scale with a vertical streak; head with rather numerous vertical lines; a yellowish spot on the operculum with bluish centre; the soft dorsal and anal with oblique, the caudal with vertical stripes.

Cape of Good Hope. Brazil.

a. Adult. Brazil. From the Berlin Museum.

3. Novacula javanica.

Bleeker, Synon. Labr p. 32, and *Atl. Ichth.* p. . tab. 30. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 28–29.

Some small scales below the orbit; the two first dorsal spines are flexible, not produced and continuous with the remainder of the fin. A light spot on the middle of the side, above the extremity of the pectoral; belly violet between the pectoral and ventral fins; head without bands; caudal with transverse, anal with oblique bluish streaks. (*Bleek.*)

Java.

4. Novacula cyanifrons.

Xyrichthys cyanifrons, *Cuv. & Val.* xiv. p. 46.

$D. \frac{9}{12}. \quad A. \frac{3}{12}.$

Closely allied to *N. cultrata*. The two first dorsal spines are flexible and a little longer than the following; ventral fins produced, extending to the origin of the anal. Rose-coloured; a blue band along the upper ridge of the head to the dorsal fin; dorsal with oblique, caudal with transverse blue streaks. (*Val.*)

Pondicherry.

5. Novacula martinicensis.

Xyrichthys martinicensis, *Cuv. & Val.* xiv. p. 49.

$D. \frac{9}{12}. \quad A. \frac{3}{12}.$

Similar to *N. cultrata*, but rather more elongate, its height being one-fourth of the total; all the dorsal spines flexible, not produced. Rose-coloured, each scale with a vertical streak; head immaculate. (*Val.*)

Martinique.

6. Novacula uniocellata.

Xirichthys uniocellatus, *Spix, Pisc. Brasil.* p. 97. tab. 55; *Cuv. & Val.* xiv. p. 48.

$D. \frac{9}{12}. \quad A. \frac{3}{12}.$ L. lat. 27. L. transv. 2/9.

Dorsal spines not produced, the two anterior flexible; a few rudimentary scales below the orbit; the ventral fins extend to the vent. Yellow, the lower parts with a reddish tint; each scale with a vertical light-violet streak, the streaks being silvery on the scales of the belly. Head with numerous pearl-coloured vertical lines; a bright-red cross-band behind the extremity of the pectoral. Dorsal and anal red, yellow posteriorly, the former with a black ocellus edged with white between the sixth and seventh spines; caudal yellow, with indistinct violet transverse lines.

Coast of Brazil.

a. Very fine specimen. Bahia. From Dr. O. Wucherer's Collection.

7. Novacula lineata.

? Coryphæna lineata, *L. Gm. Syst.* i. p. 1195; *Bl. Schn.* p. 297.
Xyrichthys lineatus, *Cuv. & Val.* xiv. p. 50.

$D. \frac{9}{12}. \quad A. \frac{3}{12}.$ L. lat. 25. L. transv. 2/10.

Several small scales below the orbit; the two anterior dorsal spines are flexible, not produced; the outer ventral ray prolonged, not extending to the vent. Rose-coloured; a large oblong (in spirits, pearl-coloured) blotch on each side of the belly, below the pectoral; narrow lines of the same colour descend from the blotch, crossing the belly and ascending to the blotch of the other side.

Caribbean Sea.

a, b. Four and five inches long.

8. Novacula mundiceps.

Xirichthys mundiceps, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 143.

D. $\frac{9}{12}$. A. $\frac{3}{11}$. L. lat. 24. L. transv. 2/9.

The dorsal fin commences nearly over the middle of the operculum; its first spine is the shortest. "The profile in front of the eye descends downwards in a nearly straight and oblique line at an angle of about 43° to the longitudinal axis of the body, and is nearly parallel with the præoperculum." (?) Uniform flesh-coloured, tinged with brown; belly silvery. (*Gill.*)

Coasts of Lower California.

a–c. Young. Cape St. Lucas. Presented by the Smithsonian Institution.

b. Upper edge of the head rather obtuse.

9. Novacula tæniurus.

Labrus fuscus, *Lacép.* iii. p. 437.
Sparus hemisphærium, *Lacép.* iv. pp. 53, 160.
—— brachio, *Lacép.* iv. pp. 54, 160.
Labrus tæniurus, *Lacép.* iii. pp. 448, 518. pl. 29. fig. 1.
Xyrichthys tæniurus, *Cuv. & Val.* xiv. p. 54. pl. 393 (not *Bleek.*).

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 25. L. transv. 3/9.

A few rudimentary scales below the orbit. The two anterior dorsal spines are flexible and not produced. Ventral rather short. Brown, each scale with light centre; belly reddish; head immaculate. Dorsal and anal fins with oblique brown spots and stripes; a deep-black spot between the three anterior dorsal spines; caudal brown, with a broad yellow band across the base; ventral and axil of the pectoral blackish.

Mauritius.

a. Adult. Mauritius. From the Collection of the Zoological Society.

10. Novacula vanicolensis.

Julis vanicorensis, *Quoy & Gaim. Voy. Astrol. Poiss.* p. 704. pl. 20. fig. 1.
Xyrichthys vanicolensis, *Cuv. & Val.* xiv. p. 57.
Novacula cephalotænia, *Bleek. Floris,* p. 333.
—— tæniurus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado en Makass.* p. 62; (not *Cuv. & Val.*).
Novaculichthys tæniurus, *Bleek. Atl. Ichth.* p. . tab. 31. fig. 5.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 26. L. transv. 3/10.

A few rudimentary scales below the orbit; the two first dorsal spines are flexible, not produced, somewhat remote from the third, the membrane between the second and third not being notched; ventral not prolonged. Brown, each scale green in the middle; abdomen reddish; head with three brown bands: the upper is short, horizontal, and runs from the eye to the origin of the lateral line; the two others are oblique, and descend from the eye to the suboperculum. Dorsal and anal fins with oblique brown spots; a deep-black spot between the three anterior dorsal spines; caudal brown, with a broad yellow band across the base; ventral and basal portion of the pectoral black.

Vanicolo, New Hebrides, Celebes, Floris, and Timor.

a–b. Adult and half-grown: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Dr. v. Bleeker (Synon. Labr. p. 20) considers this species as identical with *N. tæniurus*.

11. **Novacula hoedtii.**

Julis bifer, *Lay in Beech. Voy. Zool. Fishes*, p. 64. pl. 18. fig. 2.
Novacula hoedti, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina*, p. 59.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 25–26.

A few rudimentary scales below the orbit; the two first dorsal spines are flexible, produced, continuous with the remainder of the fin; ventral as long as pectoral. Brown, each scale bluish-white in the middle; head yellow, with brown, blue-edged bands radiating from the eye, three running from the eye over the opercles; dorsal with round and oblong brown spots; anal and ventral black; caudal yellow on its basal half and black on its posterior; base and axil of the pectoral black.

Celebes, Sangi, Amboyna.

a. Young. From Dr. P. v. Bleeker's Collection.

According to Dr. v. Bleeker (Synon. Labr. p. 20) this species also is identical with *N. tæniurus*.

12. **Novacula altipinnis.**

Xyrichthys altipinnis, *Rüpp. N. W. Fische*, p. 22. taf. 7. fig. 1.

D. $\frac{9}{12}$. A. $\frac{3}{12}$.

The spinous dorsal is emarginate, the anterior and posterior spines being the highest; the soft dorsal and anal rather elevated. Greenish, the soft dorsal and anal with numerous oblique brown lines; a black spot superiorly on the anterior dorsal spines; a few black spots behind the root of the pectoral. (*Rüpp.*)

Djetta.

B. Cheek with two or three series of scales; no anterior division of the dorsal fin.

13. **Novacula macrolepidota.**

Labrus macrolepidotus, *Bl.* taf. 284.
—— arago, *Quoy & Gaim. Voy. Uran. Zool. Poiss.* p. 263. pl. 65. fig. 2 (very bad).
Julis tænianotus, *Quoy & Gaim. l. c.* p. 271.
—— trimaculata, *Cuv. & Val.* xiii. p. 386.
Xyrichthys macrolepidotus, *Cuv. & Val.* xiv. p. 59; *Peters, Wiegm. Arch.* 1855, p. 264.
—— arago, *Steindachner, Verhandl. Zool. Bot. Gesellsch. Wien*, 1861, p. 136. taf. 4. fig. 1.
Novacula julioides, *Bleek. Banda*, i. p. 254.
Novaculichthys macrolepidotus, *Bleek. Atl. Ichth.* p. . tab. 31. fig. 6.

D. $\frac{9}{12-13}$. A. $\frac{3}{12-13}$. L. lat. 25. L. transv. 3/9. Vert. 10/15.

The upper profile of the head obtuse. Two series of very small scales below the eye; the two first dorsal spines are flexible, not produced, somewhat remote from the third, the membrane between the second and third not being notched; the outer ventral ray is produced into a long filament. Reddish-rosecoloured: head with three broad brown bands radiating from the posterior part of the orbit, the upper ascending to the neck, the lower descending to the suboperculum; opercular lobe brown; a more or less interrupted band along the middle of the tail, and an oblong spot above the pectoral. A blackish-violet spot on the thorax, before the root of the ventral; a deep-black spot between the two first dorsal spines; outer half of the dorsal and anal with oblique undulated lines.

Coast of Mozambique, East Indian Archipelago, New Guinea, Waigiou.

a–b. Adult. Mozambique. From Prof. Peters's Collection.
c. Adult: skeleton. Mozambique. From Prof. Peters's Collection.
d. Half-grown. From Dr. P. v. Bleeker's Collection as *Novacula julioides*.

C. Cheek scaly; no anterior division of the dorsal fin.

14 **Novacula bimaculata.**

Xyrichthys bimaculata, *Rüpp. Atl. Fische*, p. 43. taf. 10. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$.

Cheeks scaly; the two anterior dorsal spines are flexible, produced, continuous with the remainder of the fin. Red: a black spot on each side; no spot behind the eye; dorsal fin with undulated red streaks; anal violet, with undulated yellowish lines; caudal with brownish-red transverse streaks. (*Rüpp.*)

Massaua.

Xyrichthys virens (Parkins.), Cuv. & Val. xiv. p. 47, from Otaheiti, appears to belong to this division; the drawing, on which the species has been founded, does not show any production of the anterior dorsal spines.

D. Cheek scaleless; the two anterior dorsal spines form a more or less separate division.

a. Upper edge of the head sharp.

15. **Novacula pavo.**

Xyrichthys pavo, *Cuv. & Val.* xiv. p. 61. pl. 394; *Bleek. Atl. Ichth.* p. tab. 29. fig. 2.
—— pavoninus, *Cuv. & Val.* xiv. p. 63.
Novacula pavo, *Bleek. Ternate,* vii. p. 379.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 30.

Some small scales behind and below the orbit. The two anterior dorsal spines are flexible, produced, and entirely separate from the remainder of the fin; the outer ventral ray is produced. Rosy: a black, blue-edged spot on the back, below the sixth dorsal spine; sides of the head and vertical fins with oblique and transverse undulated blue lines; anal with a blue band along the margin.

Bourbon, Mauritius, Cocos, Ternate, Sandwich Islands.

a. Adult: stuffed. Mauritius.

16. **Novacula dea.**

Xyrichthys dea, *Schleg. Faun. Japon. Poiss.* p. 171. pl. 87.
—— puniceus, *Richards. Ichth. Chin.* p. 261.
Novacula dea, *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Japan,* iv. p. 20.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 28.

Some small scales below the orbit; the two anterior dorsal spines are flexible, produced, subcontinuous with the remainder of the fin; the outer ventral ray is produced. Rosy: a black, blue-edged spot on the back, below the sixth dorsal spine. Dorsal with numerous oblique bluish lines; anal with a bluish band along the base; caudal edged with blue superiorly and inferiorly.

Japanese Sea.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

17. **Novacula tetrazona.**

Novacula tetrazona, *Bleek. Bali,* iii. p. 169.
Xyrichthys tetrazona, *Bleek. Atl. Ichth.* p. . tab. 30. fig. 1.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 28.

A few very small scales below the eye; the two anterior dorsal rays are entirely separate from the remainder of the fin, and much prolonged. Yellowish-rose, with five very broad brownish-black cross-bands, the anterior of which is on the head; most of the scales between the bands have an irregular brown spot; a narrow band from below the eye to behind the maxillary. The anterior dorsal and the ventral black; the soft dorsal with two deep-black ocelli within the third and fourth bands; a brown band across the base of the pectoral.

Bali.

a. From Dr. P. v. Bleeker's Collection.

18. Novacula aneitensis.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 30.

A few scales below the orbit; the two first dorsal spines are flexible, slightly produced, remote from, but subcontinuous with, the remainder of the fin, the membrane between the second and third spines being notched. The outer ventral ray is produced. Red (in a dried state), with a large roundish white blotch on the middle of the trunk, below the lateral line; a dark shining blotch on the humeral region; another on the side of the back, below the sixth and seventh dorsal spines, extending on the fin and below the lateral line; a deep-black spot between the third dorsal ray and the lateral line. The soft dorsal and anal fins with oblique dark bands.

New Hebrides.

a–b. Ten inches long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

19. Novacula mundicorpus.

Iniistius mundicorpus, *Gill in Proc. Acad. Nat. Sc. Philad.* 1862, p. 145.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 25.

Yellowish or brownish, immaculate; the dorsal fin with several oblique bars between its rays. (*Gill.*)

Cape St. Lucas (California).

b. Upper edge of the head rather obtuse.

20. Novacula kallosoma.

Novacula kallosoma, *Bleek. Act. Soc. Sc. Indo-Nederl.* vi. *Amboina*, xi. p. 5.

Novaculichthys kallosoma, *Bleek. Synon. Labr.* p. 20.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 27.

The upper profile of the head obtuse. A few scales below the orbit; the two first dorsal spines are flexible, much prolonged, remote from, but continuous with, the remainder of the fin; the outer ventral ray is produced. Red: head and body with white spots edged with brown; the spots on the head are band-like, those on the body quadrangular and disposed in four longitudinal and four transverse series; the two anterior spots of the lower series are confluent with those of the other side; a white, brown-edged band across the chest; sides of the body with oblique brown stripes besides the spots. (*Bl.*)

Amboyna and Bali.

a. Two and three-quarter inches long: not good state. From Dr. P. v. Bleeker's Collection.

E. Cheek scaly; the two anterior dorsal spines form a more or less separate division.

21. Novacula pentadactyla.

Valent. figs. 67, 123, 292; *Renard*, i. fig. 84, ii. figs. 6, 112; *Ruysch*, tab. 20. fig. 8.
Blennius, sp., *Ankarkrona, Act. Holm.* i. 1740, p. 451. pl. 3. fig. 2.
Coryphæna pentadactyla, *L. Syst.* i. p. 447; *Bl.* taf. 173; *Bl. Schn.* p. 294.
Hemipteronotus quinque-maculatus, *Lacép.* iii. p. 215.
Novacula pentadactyla, *Cuv. & Val.* xiv. p. 69. pl. 395; *Bleek. Celeb.* i. p. 222.
—— sexmaculata, *Cuv. & Val.* xiv. p. 72.
Hemipteronotus pentadactylus, *Bleek. Atl. Ichth.* p. . tab. 30. fig. 4.

$$\mathrm{D.}\ 2\,\Big|\,\frac{7}{12}.\quad \mathrm{A.}\ \frac{3}{12}.\quad \mathrm{L.\ lat.}\ 28.\quad \mathrm{L.\ transv.}\ 2/10.$$

Cheeks scaly; the two first dorsal spines are flexible, produced, and entirely separate from the remainder of the fin. The outer ventral ray is slightly produced. Greenish: a series of five or six or less round red (in spirits, white) spots behind the eye and on the origin of the lateral line; a blackish blotch on the side of the body; dorsal and anal with a red streak along the margin and the base, the former with reticulated spots, the latter with two stripes of the same colour.

East Indian Archipelago. China.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult. China. Presented by Vice-Admiral Sir E. Belcher, C.B.

22. Novacula punctulata.

Cuv. & Val. xiv. p. 73.

$$\mathrm{D.}\ 2\,\Big|\,\frac{7}{12}.\quad \mathrm{A.}\ \frac{3}{12}.\quad \mathrm{L.\ lat.}\ 26.$$

Cheeks scaly; the two first dorsal spines are flexible, produced, remote from, but subcontinuous with, the remainder of the fin; the outer ventral ray is slightly produced. Greenish, each scale with a bluish vertical streak and with a white (during life, red) dot at the base; a large black blotch on the side, behind the extremity of the pectoral; a yellow blotch below the black one. No spot behind the eye.

China.

a. Adult. Old Collection.
b. Half-grown. China.

Bleeker also describes a *Novacula punctulata* (Celebes, iv. p. 170), but afterwards refers his specimens to *N. pentadactyla* (Synon. Labr. p. 22).

23. Novacula twistii.

Novacula twistii, *Bleek. Ternate,* vii. p. 381.
Hemipteronotus twistii, *Bleek. Atl. Ichth.* p. . tab. 29. fig. 1.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 27–28.

Cheek scaly; the two anterior dorsal spines are flexible, slightly produced, remote from, and subcontinuous with, the remainder of the fin. The outer ventral ray is slightly prolonged. Greenish-rose, with a large red blotch on the middle of the side, below the lateral line; a lighter spot below the red one. Dorsal fin with oblique bluish lines; the other fins uniform.

Ternate.

a. Adult. From Dr. P. v. Bleeker's Collection.

Novacula celebica, Bleek. Act. Soc. Sc. Indo-Nederl. i. Manado en Makassar, p. 61 (or *Hemipteronotus celebicus*, Bleek. Atl. Ichth. tab. 30. fig. 5), is closely allied to this species, but is said to differ in having a large oblong red or violet spot on the free portion of the tail.—Celebes.

a. Bad state. From Dr. P. v. Bleeker's Collection.

24. Novacula melanopus.

Novacula melanopus, *Bleeker, Act. Soc. Sc. Indo-Nederl.* ii. *Amboina,* viii. p. 82.
Hemipteronotus melanopus, *Bleek. Atl. Ichth.* p. . tab. 29. fig. 3.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 28.

Cheeks scaly; the two anterior dorsal spines are flexible, slightly produced, remote from the third, with the base of which the membrane of the second is united; the outer ventral ray is produced. Greenish-rosecoloured, with a large oblong red blotch on the side; vertical fins with oblique or transverse bluish lines; a large dark-violet spot on the posterior lower part of the anal.

Amboyna.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

25. Novacula spilonotus.

Novacula spilonotus, *Bleeker, Act. Soc. Sc. Indo-Nederl.* ii. *Amboina,* viii. p. 83.
Hemipteronotus spilonotus, *Bleek. Atl. Ichth.* p. tab. 30. fig. 3.

D. $2 \mid \frac{7}{12}$. A. $\frac{3}{12}$. L. lat. 28.

Cheeks scaly; the two anterior dorsal spines are flexible, slightly produced, remote from the third, with the base of which the membrane of the second is united; the outer ventral ray is produced.

Greenish-rosecoloured, with a large oblong red (in spirits, white) blotch on the side; vertical fins with oblique or transverse bluish lines; one or two series of small brown spots between the soft dorsal fin and the lateral line.

Amboyna.

a. Adult. From Dr. P. v. Bleeker's Collection.

32. JULIS*.

Julis, sp., *Cuv. & Val.*

Body compressed, oblong, covered with scales of moderate size; head entirely naked; lateral line not interrupted; snout of moderate extent, not produced; no posterior canine tooth. Dorsal spines eight.

Seas between the Tropics and the parts adjoining them.

The *skull* of *Julis* is distinguished by thick ossifications of the principal frontal bones, which are especially conspicuous in old individuals; they form a deep cavity for the processes of the intermaxillaries. The suborbital ring also is very solid. In all the species the vertebral column appears to be composed of eleven abdominal and fourteen caudal vertebræ. *J. pavo, lunaris*, and *dorsalis* have been examined.

1. Julis pavo.

Labrus pavo, *Hasselqu. Iter Palæst.* p. 389; *Lacép.* iii. p. 484.
—— syriacus, *Bl. Schn.* p. 244.
—— hebraicus, *Risso, Ichth. Nice*, p. 232 (not *Lacép.*).
Julis turcica, *Risso, Eur. Mérid.* iii. p. 299.
—— pavo, *Cuv. & Val.* xiii. p. 377. pl. 386; *Cuv. Règne Anim. Ill. Poiss.* pl. 87. fig. 1.
—— unimaculata, *Lowe, Trans. Zool. Soc.* iii. p. 11.
Labrus cretensis, *Gronov. Syst. ed. Gray*, p. 82.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 30. L. transv. 3/11. Vert. 11/14.

The height of the body equals the length of the head, and is contained three times and a third in the total. Caudal lobes more or less produced. Pectoral with a large black blotch at its extremity and with a small blackish spot superiorly in the axil. Body greenish or reddish, each scale with a red vertical streak; a broad, oblique, transverse green band behind the pectoral; head with irregular green bands; dorsal green, with a very broad black longitudinal band from the third dorsal spine, occupying nearly the whole of the middle; basal half of the anal fin black or violet. Caudal lobes with a blackish longitudinal streak. The green colour is sometimes replaced by bright-red.

Mediterranean. Sea of Madeira.

a. Fine specimen. Fernando Po. From Mr. Fraser's Collection.

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* 1. Julis lessonii, *Cuv. & Val.* xiii. p. 384.—St. Helena.
2. *Renard*, fig. 179.—Julis pavoninus, *Cuv. & Val.* xiii. p. 483.—East Indies.

b. Adult. South Europe. Presented by R. B. Webb, Esq.
c–d, *e*, *f*, *g*. Fine specimens. Madeira.
h. Adult. Lanzarote. Presented by the Rev. R. T. Lowe.
i–k. Half-grown. Italy.
l–m. Adult male and female. Alexandria. From Mr. Petherick's Collection.
n–o. Adult. Sicily.
p. Adult: skin. Malta. From Mr. Yarrell's Collection.
q–t. Adult: bad state. Malta. From the Haslar Collection.
u. Adult: skin. From Gronow's Collection.
v. Adult: skin. From Mr. Yarrell's Collection.
w, *x*. Adult.
y. Adult: skeleton. Madeira. Purchased of Mr. Stevens.

Var. *α*. (*J. unimaculata.*) Several dark cross-bars on the back, the middle of which is nearly black and extends more or less on the dorsal fin.

a. Many fine specimens from Madeira, with the type of *J. unimaculata*, Lowe.
b–c. Adult: skins. Malta. From Mr. Yarrell's Collection.
d. Adult.
e. Adult: skeleton. Madeira. From the Haslar Collection.

Var. *β*. Uniform brownish-black (in spirits), an indistinct lighter cross-band behind the pectoral. A black band occupies nearly the whole of the dorsal fin; basal half of the anal fin bluish-black. (? *Labrus lunaris*, Bloch, v. p. 127. pl. 281.—*Julis blochii*, Cuv. & Val. xiii. p. 422.)

a. Adult. Niger Expedition. From Mr. Fraser's Collection.

2. **Julis lunaris.**

Seba, iii. tab. 31. fig. 7; *Valent.* fig. 178; *Renard*, ii. fig. 39.
Labrus lunaris, *L. Syst. Nat.* i. p. 474; *Lacép.* iii. pp. 427, 467; *Gronov. Syst. ed. Gray*, p. 82.
Labrus, no. 180, *Gronov. Mus. Ichthyol.* ii. tab. 6. fig. 2; *Zoophyl.* p. 71. no. 242.
Scarus gallus, *Forsk. Descr. Anim.* p. 26.
Labrus ceylonicus, (*Forst.*) *Penn. Ind. Zool.* p. 56. pl. 16; *Bl. Schn.* p. 246; *Lacép.* iii. pp. 427, 472.
—— viridis, *Bl.* v. p. 129. taf. 282; *Bl. Schn.* p. 243; *Lacép.* iii. pp. 454, 520 (according to *Bleeker*).
—— gallus, *L. Gm.* i. p. 1284; *Bl. Schn.* p. 245.
Osphronemus gallus, *Lacép.* iii. p. 122.
Julis hardwickii *Gray, Ind. Zool. Pisc.* tab. 9. fig. 1.
—— porphyrocephala, *Benn. Proc. Comm. Zool. Soc.* ii. p. 183.
—— duperrei, *Quoy & Gaim. Voy. Uran. Zool.* p. 268. pl. 56. fig. 2; *Cuv. & Val.* xiii. p. 421.
—— lunaris, *Cuv. & Val.* xiii. p. 409; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 28, *Synon. Labr.* p. 6, and *Atl. Ichth.* p. 90. tab. 33. fig. 5.
—— viridis, *Cuv. & Val.* xiii. p. 420 (according to *Bleeker*).

Julis meniscus, *Cuv. & Val.* xiii. p. 415.
—— trimaculatus, *Rüpp. N. W. Fische*, p. 13 (not *Q. & G.*).
—— mertensii, *Cuv. & Val.* xiii. p. 421.
—— celebicus, *Bleek. Celebes*, viii. p. 313 (young).
—— lutescens, (*Solander*) *Zool. Beech. Voy. Fishes*, p. 65. pl. 19. fig. 2.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 28. L. transv. $\frac{2\frac{1}{2}}{10}$. Vert. 11/14.

The height of the body is equal to the length of the head, and one-fourth of the total (the caudal lobes not included). Caudal lobes prolonged. *Pectoral with a large oblong-ovate deep-violet spot*; head violet, with several oblique reddish bands; body green, each scale with a brown vertical streak; dorsal fin red, with yellow margin; anal violet, with broad yellow margin and red base; caudal yellow, its base and its lobes being red or green.—*Young* specimens with a round black spot between the second and fourth dorsal rays, and with another at the root of the caudal.

From the eastern coasts of Africa to the Sea of China and to Polynesia.

a. Half-grown. Mozambique. From Prof. Peters's Collection.
b. Adult: skin. Ceylon. From Dr. Kelaart's Collection.
c. Adult. Ceylon. From the Collection of the Zoological Society. —Type of *J. porphyrocephala*, Benn.
d, *e*. Half-grown and young. Amboyna. Purchased of Mr. Frank.
f. Adult: bad state. Moluccas. Purchased of Mr. Frank.
g, *h*. Adult. China.
i. Adult: skin. China. Presented by J. R. Reeves, Esq.
k. Fine specimen. Hongkong. Presented by J. C. Bowring, Esq.
l. Half-grown: stuffed. Aneiteum. From Mr. Macgillivray's Collection.
m. Young. From Dr. P. v. Bleeker's Collection (*J. celebicus*).
n, *o*, *p*. Adult, half-grown, and young.
q–r. Adult: stuffed: not good state.
s. Adult: skeleton. China.

Science is much indebted to Dr. v. Bleeker for his investigations into the synonymy of this species, whereby nearly half a dozen nominal species are erased from the system. How many species established within the last three years will share a similar fate!

3. Julis cupido.

Schleg. Faun. Japon. Poiss. p. 170. pl. 86 bis, fig. 3; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 30, and *Atl. Ichth.* p. 93. tab. 33. fig. 1.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. transv. 2/8.

Caudal fin truncated. The height of the body is nearly equal to the length of the head, and is contained four times and a quarter in the total. The spinous dorsal is low. *Pectoral with a large black blotch on its posterior half. A dark, denticulated band proceeds from the operculum to the caudal.* A band (bluish, in spirits) runs from the eye to the extremity of the snout, two others from the eye backwards over the operculum; a bluish spot at the angle of the mouth, and several others on the upper side of the head; another band crosses the nape of the neck and descends to the gill-opening; vertical fins violet, with the outer portions yellowish.

Sea of Japan. Batavia.

a. Half-grown. From Dr. P. v. Bleeker's Collection.

4. Julis amblycephalus.

Julis amblycephalus, *Bleek. Natuurk. Tydschr. Nederl. Ind.* xi. 1856, p. 83, and *Atl. Ichth.* p. 90. tab. 33. fig. 6.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. 2/9.

The height of the body is contained five times and a fourth in the total length (the caudal lobes not included), the length of the head four times and three-fourths. Snout convex, its lower profile ascending in a similar curve to that in which the upper descends. Posterior canine tooth none. Dorsal spines pungent, shorter than the rays; caudal with the lobes produced. The length of the ventral is three-fifths of that of the pectoral, which is shorter than the head. *Colours in spirits*: the upper two-thirds of the head and body are dark brownish-olive, each scale having a shining vertical streak, the lower white. A very narrow blue, dark-edged line runs from the lower angle of the orbit to the axil, a second narrow bluish line across the angle of the præoperculum. Dorsal fin blackish, anteriorly black, the soft portion with a narrow whitish margin; anal immaculate, transparent; caudal transparent, with the lobes dark olive; pectoral yellowish, blackish towards its extremity; a broad triangular black spot at the axil.

Ceylon, Java, Celebes, Sangi, and Amboyna.

a. Fine specimen, fifty lines long. From the Collection of the Zoological Society.

b Bad state. From Dr. P. v. Bleeker's Collection.

5. Julis melanochir.

Julis melanochir, *Bleek. Act. Soc. Sc. Indo-Nederl.* ii. *Amboina,* viii. p. 77, and *Atl. Ichth.* p. 89. tab. 33. fig. 2.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 28.

The height of the body is nearly equal to the length of the head, and is contained five times and a quarter in the total. Caudal fin with the angles much produced, one-fourth of the total length. *Head violet, with two blue, black-edged streaks,* the upper from the lower part of the eye to the operculum, the lower from the angle of the mouth to the suboperculum. Body green, each scale with a red transverse streak. *Pectoral with a large, roundish, black, transverse spot*; vertical fins yellow: dorsal with a brown intramarginal line; anal blue-edged; the upper and lower margins of the caudal brownish.

Amboyna.

a. From Dr. P. v. Bleeker's Collection.

6. Julis aneitensis.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 28. L. transv. 3/9.

The height of the body equals the length of the head, and is somewhat more than one-fifth of the total; the outer caudal rays produced into filaments; the length of the ventral is two-thirds of that of the pectoral in half-grown specimens, three-fourths in adult. *Colours of dried specimens*: anterior part of the back and thorax brownish-olive; body greenish, each scale with a vertical streak; *head violet, with three green bands* edged with darker: the upper from the eye to the origin of the lateral line, the middle from below the eye to the hind part of the suboperculum, the lower from the angle of the mouth to the suboperculum; sometimes a fourth on the interoperculum. *Pectoral with a broad oblique black band* across its posterior half, and with a black spot in the axil; a black spot between the second and third dorsal spines: *two fine brown lines run along the whole length of the dorsal*, one along its base, and the other above the middle of its height; they are the edges of a broad brownish band running along the middle of the fin: *anal with a similar line* running nearer to its base than to its margin, and separating the brown basal portion from the green outer one. A yellow band along the upper and lower margins of the caudal.

North-east coast of Australia. New Hebrides. Norfolk Island.

a–b. Nine inches long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

c. Eleven inches long: stuffed. Cato Island (N.E. Australia). From the Collection of F. M. Rayner, Esq.

d. Adult. Norfolk Island. From the Haslar Collection.

7. Julis genivittata.

Labrus argentatus, var., *Lacép.* iii. pl. 18. fig. 1.
Julis genivittata, *Cuv. & Val.* xiii. p. 416.
—— commersoni, *Cuv. & Val.* xiii. p. 418.

D. $\frac{8}{13}$. A. $\frac{3}{11}$.

Caudal lobes produced. *Pectoral with a blackish spot, darkest on the margin of the fin.* Green: head with bands, two of which are curved, on the cheek below the eye, and another behind the eye. Each scale on the body with a vertical streak; no light cross-band behind the pectoral; dorsal and anal with the base brown and the margin green; caudal green, the middle of the margin lighter. Dorsal fin sometimes with a longitudinal band along the middle. (*Val.*)

Mauritius; Red Sea.

a–b. Adult: stuffed. Red Sea. Presented by J. Burton, Esq.

8. Julis melanoptera.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. $\frac{2\frac{1}{2}}{9}$.

The height of the body is a little more than the length of the head, and one-fourth of the total (the caudal lobes not included). Posterior canine tooth none; two canine teeth of the lower jaw are received between two of the upper. Dorsal spines pungent, shorter than the rays; caudal with the lobes produced; ventral pointed, not prolonged; pectoral shorter than the head. *Colours in spirits*: head uniform purplish-brown, without any markings; body greenish-olive, with a broad lighter transverse band, below the second to sixth dorsal spines, extending to the belly, each scale within the light band with a shining vertical streak; dorsal and anal dark-violet, the former with a black spot anteriorly; caudal light-coloured, with the upper and lower margins greenish; pectoral with an oblique oblong black spot; axil blackish.

Hab. —— ? Probably Ceylon.

a–b. Sixty-seven lines long From the Collection of the Zoological Society.

9. **Julis bicolor.**

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 28. L. transv. $\frac{2\frac{1}{2}}{8}$.

The height of the body is two-ninths of the total length (the caudal lobes not included), the length of the head one-fourth. Posterior canine tooth none; the lower pair of canine teeth are received between those of the upper. Dorsal spines pungent, shorter than the rays; caudal lobes produced. The length of the ventral is two-thirds of that of the pectoral, which is shorter than the head. *Colours in spirits*: the upper half of the head and body is blackish-olive to below the end of the dorsal, darkest behind the eye and below the posterior part of the dorsal; the lower half of the fish and the hinder part of the tail are greenish-olive—both the light and dark colours being well defined. Dorsal fin with a black spot between the first and third spines, and with a broad violet longitudinal band, which becomes broader posteriorly, leaving only a narrow portion of the base and the margin yellowish; anal yellowish, with a violet band along the base; base and lobes of the caudal blackish. A large black spot on the hinder half of the pectoral; a black spot superiorly in the axil.

Hab. —— ?

a–b. Five inches long. From Mr. Gerrard's Collection.

10. **Julis lucasana.**

Gill, Proc. Acad. Nat. Sc. Philad. 1862, p. 142.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 26.

The height of the body is one-fifth of the total length, the length of the head one-fourth. The colour of the upper half, except a lighter band below the dorsal fin, is dark-purplish, and well defined from the whitish lower half. The soft dorsal with a whitish margin, the remainder of the fin dark. The basal half of the anal is light-brownish, and the marginal half whitish. Caudal yellowish, with a narrow whitish upper and lower margin and with an inframarginal purplish band. Pectoral with a blackish dot superiorly in the axil.

Cape St. Lucas (California).

a. Fine specimen. Cape St. Lucas. Presented by the Smithsonian Institution.

11. Julis umbrostigma.

Julis umbrostigma, *Rüpp. N. W. Fische*, p. 11. taf. 3. fig. 2; *Bleek. Atl. Ichth.* p. 92. tab. 34. fig. 2.

—— souleyetii, *Cuv. & Val.* xiii. p. 457; *Eyd. & Soul. Voy. Bonite, Zool.* i. p. 190, *Poiss.* pl. 6. fig. 2; *Bleek. Kokos,* iii. p. 176.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 28. L. transv. 3/10.

The height of the body is nearly equal to the length of the head, and one-fourth or two-ninths of the total. Posterior canine tooth none. Caudal subtruncated; ventral not produced. Green, with two more or less distinct reddish longitudinal bands, one commencing at the point of the operculum, the other at the lower part of the axil. *Body with small brown vertical spots*, sometimes disposed in cross-bands, *those on the head scattered.* Two oblique lines on each side of the snout. *Dorsal with a black spot anteriorly*; anal with two reddish longitudinal bands.

From the Red Sea to the Sandwich Islands.

Var. *α*. Dorsal fin reddish, with a broad green band along the middle.—Red Sea. Sea of China.

a. Adult: not good state. China Sea. Presented by Vice-Admiral Sir E. Belcher, C.B.

Var. *β*. Dorsal fin light-red, with the base green, and with a green intramarginal line.—New Hebrides.

b. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

12. Julis abhortani.

Julis abhortani, *Cuv. & Val.* xiii. p. 459.

D. $\frac{8}{13}$. A. $\frac{3}{11}$.

The height of the body is *one-third of the total length* (the caudal fin not included). No posterior canine tooth. Interoperculum very broad; lateral line much ramified. *Nearly uniform yellow* (in spirits); dorsal yellow, with a black spot anteriorly; anal violet inferiorly, with pale margin. (*Val.*)

Mauritius.

13. Julis matthæi.

Cuv. & Val. xiii. p. 419.

D. $\frac{8}{13}$. A. $\frac{3}{11}$.

The length of the pectoral is only one-half of that of the head, and the lower rays are the longest; caudal lobes produced. A blackish spot on the pectoral; head with streaks; each scale with a violet dot; dorsal and anal with longitudinal bands. (*Val.*)

Mauritius.

14. Julis hebraica.

Labrus hebraicus, *Lacép.* iii. pp. 455, 526.
Julis cingulata, *Quoy & Gaim. Voy. Astrol.* p. 711. pl. 15. fig. 3.
—— hebraicus, *Cuv. & Val.* xiii. p. 423.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. 2/9.

The height of the body is nearly equal to the length of the head, and one-fourth of the total (the caudal lobes not included). Caudal fin with the lobes produced. Three or four blue bands edged with darker radiate from the eye towards the opercular margins and the base of the pectoral. Green, darker on the base of the caudal; a yellow cross-band below the anterior dorsal spines; dorsal and caudal greenish, anal whitish; a black spot anteriorly on the dorsal fin.

Mauritius, Madagascar, Mozambique.

a. Adult. Mozambique. From Prof. Peters's Collection.
b, c. Adult.

15. Julis bifasciata.

Labrus, sp., *Gronov. Zoophyl.* no. 243.
Labrus bifasciatus, *Bloch*, v. p. 131. pl. 283; *Bl. Schn.* p. 243.
—— ornatus, *Gronov. Syst. ed. Gray*, 1854, p. 83.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 27. L. transv. 2/9.

The height of the body is somewhat less than the length of the head, and one-fourth of the total (the caudal lobes not included). Caudal fin deeply forked, with the lobes much produced. Head bluish (in spirits); body green, the basal membrane of each scale being darker. Trunk behind the head black, with a broad whitish cross-band below the anterior dorsal spines. Nearly the whole of the spinous dorsal black, the soft light-violet; the margin of the entire fin white. Caudal lobes dark-violet; base and extremity of the pectoral blackish-blue.

Sea of Jamaica.

a. Fine specimen. Jamaica. From Dr. Parnell's Collection.
b–h. Adult: skins. Jamaica. From Dr. Parnell's Collection.
i. Half-grown.

16. Julis detersor.

Cuv. & Val. xiii. p. 408.

D. $\frac{8}{13}$. A. $\frac{3}{11}$.

Caudal fin deeply forked; the spinous dorsal is low and scaly. Head, thorax, anterior portion of the dorsal, extremity of the pectoral and caudal lobes blackish-violet; the remainder greenish. (*Val.*)

S. Domingo; Martinique.

17. Julis jansenii.

Julis jansenii, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado & Makass.* p. 56, and *Atl. Ichth.* p. 91. tab. 34. fig. 5.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 28. L. transv. 2/9.

The height of the body is contained four times and one-third to four times and two-thirds in the total length, the length of the head four times and a third to four times and a half. Caudal fin with the lobes much produced, in young specimens rounded. Yellow, *with three very broad black cross-bands,* which are sometimes confluent; the anterior occupies the head and nape, the second the spinous dorsal and the trunk below, the third the posterior two-thirds of the soft dorsal and of the anal, and the tail between. Pectoral with a violet streak across the base.

East Indian Archipelago. Feejee Islands. New Hebrides.

a. Young. Feejee Islands. Voyage of the 'Herald.'
b–c. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

18. Julis trilobata.

Labrus trilobatus, *Lacép.* iii. pp. 454, 526 (not *Shaw*).
—— fuscus, *Lacép.* iii. p. 437.
Julis bicatenatus, *Benn. Proc. Comm. Zool. Soc.* i. 1831, p. 167.
—— quadricolor, *Less. Voy. Coqu. Zool.* ii. p. 139. pl. 35. fig. 1; *Cuv. & Val.* xiii. p. 443: *Bleek. Nat. Tydschr. Nederl. Ind.* xix. p. 339, and *Atl. Ichth.* p. 93. tab. 34. fig. 3.
—— semicœruleus, *Rüpp. N. W. Fische,* p. 10. pl. 3. fig. 1; *Cuv. & Val.* xiii. p. 442.
Scarus georgii, *Benn. Fish. Ceyl.* pl. 24.
Julis trilobatus, *Cuv. & Val.* xiii. p. 437.
—— formosus, *Cuv. & Val.* xiii. p. 439.
—— æruginosus, *Cuv. & Val.* xiii. p. 441.
—— cyanogaster, *Cuv. & Val.* xiii. p. 444.
—— erythrogaster, *Cuv. & Val.* xiii. p. 447.
Scarus (?) quinquevittatus, *Richards. Voy. Blossom, Zool.* p. 66. pl. 19. fig. 3.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 29. L. transv. $\frac{3\frac{1}{2}}{11}$.

The height of the body equals the length of the head, and is somewhat more than one-fourth of the total; caudal subtruncated, with the lobes slightly produced. Green or blue, with a red band running from the operculum across the bend of the lateral line to the caudal; back with another longitudinal band of brown or violet-colour; a broad band runs along the middle of the dorsal fin, leaving the margin and the base of the fin green, another along the basal half of the anal; dorsal with a black spot anteriorly; caudal rays green, with the membrane between red and violet. The band on the back and one on the side of the belly are continued along the upper and lower margins of the caudal; the posterior half of the pectoral blackish.

From the eastern coasts of Africa to the Seas of China and to Polynesia.

Var. *α*. Head uniform, without bands; belly and the lower third of the tail reddish, separated from the blue ground-colour by a red band extending from the lower part of the axil to the inferior caudal lobe. The middle red band emits vertical lines upwards and downwards into the blue ground-colour. (*Jul. trilobatus* and *formosus,* Valenc. *Jul. bicatenatus*, Benn.)

a. Half-grown: stuffed. South Africa. Purchased of Mr. Warwick.
b. Half-grown. Mauritius. Purchased of Mr. Gerrard.—Type of *Julis bicatenatus*.
c. Half-grown. Aneiteum. From Mr. Macgillivray's Collection.
d. Half-grown: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

We consider two specimens which are very dark-coloured, and which, in a dried state, have the head uniform blackish, as the *young* of this variety. The markings of the body, by which the species is characterized, are well preserved.

e–f. Seven inches long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Var. *β*. Entirely green: head with a red triangular spot before the eye, and with an oblique red band from the eye to the suboperculum, where it is bifurcate; another forked band below the base of the pectoral; body with three longitudinal bands, the two lower of which are red. (*Jul. quadricolor,* Less. *J. semicœruleus,* Rüpp. *J. æruginosus* and *cyanogaster,* Valenc.)

g–h. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.
i, k. Adult and half-grown: very bad state. China. Presented by Sir J. Richardson.
l–m. Adult and half-grown: stuffed. Red Sea. From Dr. Rüppell's Collection.

Var. *γ*. Like var. *β*, but six red bands radiate from the eye and extend all over the head. (*Labrus formosus,* Solander, or *Julis erythrogaster*, Valenc.)
Otaheiti. Ulea.

Valenciennes has incorrectly quoted the manuscript of Solander and the drawings of fishes made by the companions of Captain Cook. The three drawings which represent the present species were not executed by Forster, but by Parkinson on the first voyage of the celebrated navigator. Two of them represent our second variety; Solander also considered them as belonging to one species, which he intended to call *Labrus vittatus*; the one with green belly he named *L. vitt. cyanogaster*, and the other with reddish belly *L. vitt. erythrogaster.* Hence it is evident that our second variety may have the belly reddish, like our first; or, in other words, that there are specimens with maculated head and with the belly green or reddish. The third drawing is from an immature specimen, named by Solander *Labrus formosus,* and identical with our var. *γ*.

19. Julis purpurea.

Scarus purpureus, *Forsk. Descr. Anim.* p. 27.
Labrus purpureus, *L. Gm.* i. p. 1284.
Grammistes purpureus, *Bl. Schn.* p. 190.
Julis purpureus, *Rüpp. Atl. Fische*, p. 25. taf. 6. fig. 2; *Cuv. & Val.* xiii. p. 445.

$$D. \frac{8}{13}. \quad A. \frac{3}{11}.$$

The height of the body equals the length of the head, and is scarcely more than one-fourth of the total. Caudal subtruncated, with the lobes slightly produced. Green: on each side of the head five red bands, one of which passes through the eye and over the base of the pectoral, and is continued into its fellow from the other side; along each side of the body three red bands, one of which is broad and runs from the operculum across the bend of the lateral line to the caudal, emitting numerous vertical streaks upwards into the green ground-colour; fins greenish, dorsal and anal with a red longitudinal band.

Red Sea. Bombay.

This fish is probably another variety of *J. trilobata*, in which case the name given by Forskål would have the priority.

20. Julis guntheri.

Julis quadricolor, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manad.* p. 55 (not *Nat. Tydschr. Nederl. Ind.* xix. p. 339).
—— güntheri, *Bleek. Versl. Akad. Wet. Amst.* xiii. p. 279, and *Atl. Ichth.* p. 94. tab. 34. fig. 1.

$$D. \frac{8}{13}. \quad A. \frac{3}{11}. \quad L.\ lat.\ 27. \quad L.\ transv.\ 3\tfrac{1}{2}/9.$$

The height of the body is equal to the length of the head, and one-fourth of the total. Caudal fin truncated, with the lobes slightly produced. Greenish-olive (in spirits), with a light-coloured, well-defined band running from the opercular lobe to the middle of the caudal; a similar second band from the side of the nape to and along the upper caudal lobe. Head with two lateral bands: one from the maxillary through the eye to the opercular lobe; the other curved, below the eye; another across the occiput, and sometimes two cross-bands between the eyes. An oblique band on the thorax, below the pectoral. Dorsal fin with a black spot anteriorly, and with a broad band which runs along the middle of the dorsal fin, leaving the margin and the base of the fin of a darker colour. Anal fin uniform transparent. The lower caudal lobe with a longitudinal band similar to that of the upper; the posterior half of the pectoral blackish; a blackish spot superiorly in the axil.

Cape of Good Hope. Celebes, Sangi.

a–c. Four to five inches long. Cape of Good Hope.
d. Four and a half inches long. From Dr. P. v. Bleeker's Collection.

On account of the great similarity of this species to *J. trilobata*, I have hesitated for a long time to separate it from the latter. As, however, these four specimens are perfectly alike, and Dr. v. Bleeker also appears to possess a certain number of them, it will be better to retain them distinct from *J. trilobata*.

21. Julis nitida.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 26. L. transv. 2/8.

The height of the body is contained four times and a half in the total length, the length of the head four times and a fourth. No posterior canine tooth. Dorsal spines pungent, shorter than the rays; caudal lobes very slightly produced; the length of the ventral is two-thirds of that of the pectoral. *Colours in spirits*: a violet band, united with its fellow on the snout, runs through the eye and across the bend of the lateral line to the caudal; sometimes it is broken up into large spots, forming a single series. Dorsal fin brownish, darkest towards the margin, which is white; a black blotch between the four anterior spines; anal white; caudal with a blackish streak along each lobe; a black spot superiorly in the axil of the pectoral, which is transparent.

Jamaica.

a, b. Thirty-eight lines long. From Dr. Parnell's Collection.
c. Thirty-eight lines long: stuffed. From Dr. Parnell's Collection.

22. Julis dorsalis.

Renard, Poiss. Mol. i. tab. 28. fig. 155, ii. fig. 68; *Valent.* fig. 53.
Sparus hardwickii, *Benn. Fish. of Ceyl.* pl. 12 (not Julis hardwickii, *Gray*).
Julis dorsalis, *Quoy & Gaim. Voy. Astrol. Zool.* iii. *Poiss.* p. 713. pl. 15. fig. 5; *Cuv. & Val.* xiii. p. 449; *Bleek. Amboina*, ii. p. 564, and *Atl. Ichth.* p. 94. tab. 34. fig. 4.
—— semifasciatus, *Cuv. & Val.* xiii. p. 448.
—— urostigma, *Bleek. Sumatra*, ii. p. 287 (young).

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 29. L. transv. $\frac{2\frac{1}{2}}{9}$. Vert. 11/14.

The height of the body equals the length of the head, and is rather more than one-fourth of the total. Caudal with the lobes more or less produced; ventral pointed. Back with six black cross-bars, which sometimes extend on the dorsal fin; generally a black longitudinal band on the dorsal; a red band along the side of the tail; head with broad red bands radiating from the eye; anal fin with a more or less distinct black spot anteriorly, without longitudinal band; a black spot superiorly in the axil.

From the eastern coasts of Africa to the seas of China and to Polynesia.

a. Half-grown: bad state. Mozambique. From Prof. Peters's Collection.
b. Adult. Ceylon. Purchased of Mr. Frank.
c. Adult: skin. Ceylon. From Dr. Kelaart's Collection.
d. Half-grown: bad state. Moluccas. Purchased of Mr. Frank.

e. Young. From Dr. P. v. Bleeker's Collection (*J. urostigma*).
f. Fine specimen. Philippine Islands. Purchased of Mr. Cuming.
g, *h*. Half-grown. China. Presented by Vice-Admiral Sir E. Belcher, C.B.
i. Fine specimen. Hongkong. Presented by J. C. Bowring, Esq.
k. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.
l. Adult: stuffed. Island of Ngau (Feejee Islands), Voyage of H.M.S. Herald.
m, *n*, *o*, *p*. Adult and half-grown.
q. Adult: skeleton. Ceylon. From the Collection of the Zoological Society.

23. Julis schwanefeldii.

Bleeker, Sumatra, ii. p. 288, and *Atl. Ichth.* p. 95. tab. 33. fig. 7.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 27.

The height of the body is contained four times and three-fourths in the total length, the length of the head four times and two-fifths. Caudal fin truncated. Back with six or seven brownish-violet cross-bands, ascending towards the dorsal fin; a reddish-violet band before, and two behind the eye. The soft dorsal and the anal with bluish margins; two deep-blue spots on the dorsal fin—one between the first and third spines, the other between the second and fourth rays; anal without band along the middle.

Sumatra.

a. Twenty-eight lines long. From Dr. P. v. Bleeker's Collection.

24. Julis caudalis.

Poey, Mem. Cub. ii. p. 213.

The height of the body is two-ninths of the total length; caudal with the lobes produced. Greenish: head with blue bands extending on to the base of the pectoral and to the throat; a green spot behind the eye, edged with blue; two series of round blue spots run from the caudal towards the middle of the body; dorsal and anal fins with two blue bands, which are composed of spots on the dorsal fin. (*Poey.*)

Cuba.

25. Julis sanctæ helenæ.

Julis sanctæ helenæ, *Cuv. & Val.* xiii. p. 382.

D. $\frac{8}{14}$. A. $\frac{3}{12}$. L. lat. 29. L. transv. 3/11.

The height of the body equals the length of the head, and is one-fourth of the total (the caudal lobes not included). Caudal lobes and the first ventral ray produced. Body uniform greenish (in spirits nearly black), each scale having the centre darker; head immaculate. Dorsal fin with a black spot anteriorly, and with a broad dark-edged band running along the whole length of the fin, somewhat nearer to the base than to the upper margin; anal with a similar dand along the base; caudal green; pectoral darker towards its extremity, axil whitish.

St. Helena.

a. Fine specimen. From the Collection of the Zoological Society.

26. **Julis ascensionis.**

Quoy & Gaim. Voy. Astrol. iii. p. 706, *Poiss.* pl. 20. fig. 5; *Cuv. & Val.* xiii. p. 385.

D. $\frac{8}{14}$. A. $\frac{2}{13}$.

The height of the body is two-ninths of the total length, the length of the head two-sevenths. Caudal truncated. Green, with two red longitudinal streaks: the upper commences on the forehead and runs along the base of the dorsal fin; the second passes through the eye and extends to the root of the caudal. Dorsal and anal fins with a red band along the middle; a black spot on the first dorsal spine; pectoral without black.

Island of Ascension.

27. **Julis lamarrii.**

Julis lamarii, *Cuv. & Val.* xiii. p. 481.

D. $\frac{8}{11}$. A. $\frac{3}{11}$.

No posterior canine teeth. Caudal rounded, dorsal and anal elevated. Greenish-black, dotted and rivulated with lighter; base and a crescent in the middle of the caudal black. (*Val.*)

Mauritius.

33. GOMPHOSUS.

Gomphosus, *Lacép.* iii. p. 100.

Body compressed, oblong, covered with scales of moderate size; head entirely naked; lateral line not interrupted; snout much produced, tubiform; no posterior canine tooth. Gill-membrane attached to the isthmus. Formula of the fins: D. $\frac{8}{13}$. A. $\frac{3\,(2)}{11}$.

East Indian Seas. Polynesia.

1. **Gomphosus cæruleus.**

Acarauna longirostris, *Sevastianof in Nov. Act. Petrop.* xiii. p. 357. tab. 11.
Gomphosus cœruleus, *Lacép.* iii. p. 101. pl. 5. fig. 1, pl. 6. fig. 1; *Cuv. & Val.* xiv. p. 29; *Cuv. Règne Anim. Ill. Poiss.* pl. 89. fig. 2; *Bleek. Sumatra*, ii. p. 292, and *Atl. Ichth.* p. 86. tab. 21. fig. 5.
—— ornatus, *Benn. Life of Raffles*, p. 690.
—— viridis, *Benn. Fish. of Ceylon*, pl. 30.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 29. L. transv. 3/10.

Caudal fin emarginate, with the lobes more or less prolonged. Violet: vertical fins yellow, dorsal and anal blue-edged; the base and the upper and lower margins of the caudal blue.

East Indian Seas.

a, *b*. Fine specimens. From the Collection of the Zoological Society.

c. Adult: stuffed.

d. Half-grown. Sumatra. Presented by Sir T. S. Raffles.—Type of *Gomphosus ornatus*, Benn.

2. **Gomphosus tricolor.**

? *Renard*, ii. pl. 22. fig. 109.
Gomphosus tricolor, *Quoy & Gaim. Voy. Uran. Zool.* p. 280. pl. 55. fig. 2; *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado & Makass.* p. 54, and *Atl. Ichth.* p. 85. tab. 21. fig. 6.
—— cepedianus, *Cuv. & Val.* xiv. p. 18. pl. 390.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 29. L. transv. 3/9. Vert. 9/15.

Caudal fin slightly emarginate. Green, with a broad oblique yellow band on the shoulder and thorax; vertical fins yellow, caudal with the upper and lower margins violet; pectoral brownish-violet, with a blue band running parallel to the hinder margin, yellow at the base, with a violet spot superiorly.

East Indian Seas; western parts of the Pacific.

a. Fine specimen. Presented by Vice-Admiral Sir E. Belcher, C.B.

b. Adult. China. Presented by Sir J. Richardson.

c–d. Adult and half-grown: skins in bad state. Ceylon. From Dr. Kelaart's Collection.

3. **Gomphosus varius.**

Gomphosus varius, *Lacép.* iii. p. 104. pl. 5. fig. 2.
—— pectoralis, *Quoy & Gaim. Voy. Uran. Zool.* p. 282.
—— fuscus, *Cuv. & Val.* xiv. p. 25.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 29. L. transv. $\frac{2\frac{1}{2}}{10}$.

Caudal fin truncated, with the lobes slightly produced in adult specimens. Upper part of the head and the trunk reddish, each scale with a violet spot at the base; tail and vertical fins brown, thorax and belly whitish. A brown longitudinal band through the lower part of the eye; dorsal and anal fins with a narrow, caudal with a broad transparent margin; anal with a longitudinal series of transparent round spots.

Mauritius. Polynesia.

a. Half-grown: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

b–c. Half-grown: very bad state. Otaheiti. Old Collection, as *Labrus nasutus*.

4. **Gomphosus melanotus.**

Valent. no. 504; *Renard*, i. pl. 5. fig. 36, pl. 14. fig. 83.
Gomphosus melanotus, *Bleeker, Kokos,* iv. p. 457, and *Atl. Ichth.* p. 87. tab. 21. fig. 3.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 26.

Caudal fin rounded, with the lobes slightly produced in adult specimens. Upper part of the head and back of the trunk violet. transverse series of black spots on the latter; sides of the head and thorax rosy; sides of the body and tail orange-coloured; a brown band from the snout through the eye to the operculum. The spinous dorsal brown, edged with black; the soft, the anal and caudal red at the base and violet towards the margin, which is yellow.

Java and Kokos.

a. Adult. Purchased of Mr. Stevens.

5. Gomphosus notostigma.

Bleeker, Synon. Labr. p. 31, and *Atl. Ichth.* p. 86. tab. 21. fig. 4.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 28–29.

Caudal fin truncated. Olive (in spirits), with a large brown spot between the first and fourth dorsal spines; a brown spot superiorly in the axil of the pectoral. Dorsal and anal fins with brown margins; caudal posteriorly with a brown intramarginal band. (*Bl.*)

Java.

The typical specimen is in the Leyden Museum.

6. Gomphosus sandvicensis.

D. $\frac{8}{13}$. A. $\frac{3}{11}$. L. lat. 27.

The length of the snout is contained once and three-fourths in that of the head. Caudal fin truncated, with the lobes scarcely produced. Green (in a dried state), each scale with a brownish-olive centre; operculum and hinder portion of the pectoral black; vertical fins uniform green, caudal with the upper and lower margins brownish.

Sandwich Islands.

a. Seven inches long: stuffed. Sandwich Islands.

34. CHEILIO.

Cheilio, (*Commers.*) *Lacép.* iv. p. 432.

Body compressed, elongate, covered with scales of moderate size; head low, with the snout produced. Cheeks and opercles naked, only a few rudimentary scales on the operculum; lateral line continuous. Teeth in a single series, jaws behind the teeth granulated; no posterior canine tooth. Dorsal spines flexible, without cutaneous lobes posteriorly. Formula of the fins: D. $\frac{9}{13-14}$. A. $\frac{3\,(2)}{11-12}$.

From the eastern coasts of Africa to the Western Pacific.

1. Cheilio inermis.

Valent. figs. 203 & 516; *Renard*, i. tab. 34. fig. 181.
Labrus inermis, *Forsk.* p. 34; *Bl. Schn.* p. 262.
—— hassek, *Lacép.* iii. p. 513.

Cheilio auratus, (*Commers.*) *Lacép.* iv. p. 433; *Quoy & Gaim. Voy. Uran. Zool.* p. 274. pl. 54. fig. 2; *Cuv. & Val.* xiii. p. 341; *Bleek. Celebes,* i. p. 221.
—— fuscus, (*Commers.*) *Lacép.* iv. p. 433; *Cuv. & Val.* xiii. p. 349.
Labrus fusiformis, *Rüpp. N. W. Fische,* p. 7. pl. 1. fig. 4.
Cheilio cyanochloris, *Cuv. & Val.* xiii. p. 346. pl. 382.
—— forskalii, *Cuv. & Val.* xiii. p. 349.
—— hemichrysos, *Cuv. & Val.* xiii. p. 351; *Bleek. Banda,* i. p. 255.
—— viridis, *Cuv. & Val.* xiii. p. 352.
? Cheilio microstoma, *Cuv. & Val.* xiii. p. 353.
Cheilio ramosus, *Jenyns, Zool. Beagle, Fishes,* p. 102.
—— bicolor, *Bianc. Spec. Zool. Mosamb.* p. 254. tab. 5.
—— inermis, *Bleek. Atl. Ichth.* p. 82. tab. 31. fig. 4.

D. $\frac{9}{13-14}$. A. $\frac{3\,(2)}{11-12}$. L. lat. 45–50.

The height of the body is one-ninth or one-tenth of the total length, the length of the head two-sevenths. Generally a brown streak or a series of brown spots along the lateral line.

From the eastern coasts of Africa to the Western Pacific.

a. Adult. Mozambique. From the Berlin Museum.
b. Adult. Macassar. Purchased of Mr. Frank.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Fine specimen. Philippine Islands. Purchased of Mr. Cuming.
e. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

35. CORIS*.

Coris, Hologymnosus, Labrus, sp., *Lacép.*
Halichœres, sp., *Rüppell.*
Julis, sp., *Cuv. & Val.*
Coris, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 387.
Hologymnosus, Pseudocoris, Coris, Hemicoris, et Ophthalmolepis, *Bleek. Proc. Zool. Soc.* 1861, pp. 410–413.

Body compressed, oblong, covered with small scales (L. lat. 50 or more); head entirely naked†; lateral line not interrupted. Dorsal spines nine.

Mediterranean and the neighbouring parts of the Atlantic. Indian and Australian Seas. Polynesia.

1. Coris julis.

Julis, *Rondel.* vi. cap. 7. p. 180; *Salvian.* p. 219; *Gesner, Aquat.* iv. p. 464; *Aldrov.* i. c. 7. p. 39; *Jonston,* i. tit. 2. cap. 1. art. 5. tab. 14. fig. 3; *Willughby,* p. 324. pl. 10. fig. 1; *Ray, Syn.* p. 138.
Labrus, no. 7, *Artedi, Gen.* p. 34, and no. 1. *Synon.* p. 53.

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* 1. Labrus ornatus, *Carmich. Linn. Trans.* xii. 1818, pl. 27.—Julis ornatus, *Cuv. & Val.* xiii. p. 487, appears to me to belong rather to the *Trachinidæ*, perhaps to the group *Pinguipedina*, than to the present family.—Tristan d'Acunha.

2. *Renard,* fol. 9. no. 62.—Julis erythropterus, *Cuv. & Val.* xiii. p. 464.—East Indies

† Except in *C. lineolata.*

Sparus niloticus, *Hasselq. Iter Palæst.* p. 387.
Labrus julis, *L. Syst. Nat.* i. p. 476; *Bl.* taf. 287. fig. 1; *Bl. Schn.* p. 247; *Lacép.* iii. p. 493; *Donov. Brit. Fishes,* iv. pl. 96; *Turt. Brit. Faun.* p. 99; *Jen. Man.* p. 397; *Risso, Ichth. Nice,* p. 227; *Gronov. Syst. ed. Gray,* p. 79.
Mænas, *Klein, Miss. Pisc.* v. p. 45. no. 4. tab. 8. fig. 8
Labrus, sp., *Gronov. Mus. Ichthyol.* ii. sp. 184, and *Zoophyl.* no. 241.
Julis mediterranea, *Risso, Eur. Mérid.* iii. p. 309; *Yarr. Brit. Fishes,* 2nd edit. i. p. 344, 3rd edit. i. p. 521.
—— speciosa, *Risso, Eur. Mérid.* iii. p. 311; *Cuv. & Val.* xiii. p. 375.
—— vulgaris, *Flem. Brit. Anim.* p. 210; *Cuv. & Val.* xiii. p. 361. pl. 384; *Bonap. Faun. Ital. Pesc.* pl. fig. 1.
? Julis festiva, *Cuv. & Val.* xiii. p. 374.
Julis melanura, *Lowe, Trans. Zool. Soc.* iii. p. 12.
Air-bladder: *De la Roche, Ann. Mus.* xiv. 1809, p. 281.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 75. L. transv. 3/25. Vert. 11/14 *.

The height of the body is one-fifth of the total length, the length of the head nearly one-fourth. Anterior dorsal spines somewhat elevated. A posterior canine tooth. A small deep-black spot superiorly in the axil of the pectoral; a blue spot on the extremity of the operculum; a violet blotch between the three or four anterior dorsal spines.

Mediterranean; from the Canary Islands to the south coast of England.

Var. *α*. A red band (white in spirits) runs from the scapulary region below the lateral line to the upper half of the base of the caudal; a brownish-black cuneiform band below, from the extremity of the operculum to the end of the trunk. Dorsal whitish, with two greyish longitudinal lines.

a, b. Adult. Dalmatia.
c, d. Adult. Adriatic.
e. Adult. Bay of Naples. Presented by S. P. Pratt, Esq.
f. Half-grown. Sicily. Presented by W. Swainson, Esq.
g. Adult: skin. Nice. From Mr. Yarrell's Collection.
h, h'. Adult. Cannes. Presented by Th. Günther, M.D.
i–n. Adult. Gibraltar. From the Haslar Collection.
o, p. Half-grown. Mediterranean.
q. Half-grown. Plymouth Sound. Mus. Leach.
r, s–t. Half-grown.
u–x. Stuffed and skins.
y. Adult: skeleton. Nice. From the Berlin Museum.

Var. *β*. White band none; sides of the body with a series of numerous, short, dark vertical streaks; dorsal fin whitish. (*Julis speciosa*.)

z. Adult. Adriatic.
α. Half-grown. Sicily. Presented by W. Swainson, Esq.
β, γ–δ. Adult. From the Haslar Collection.
ε. Adult: skeleton. From the Haslar Collection.

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* Valenciennes, who states twelve abdominal and nineteen caudal vertebræ, appears to have examined the skeleton of a very different species.

Var. γ. Like var. β, but dorsal fin blackish. (*Julis melanura.*)

ζ, η. Fine specimens. Madeira.
θ. Adult: skeleton. Madeira. From the Collection of the Zoological Society.

Var. δ. White band none; a cuneiform dark lateral band, below which the sides are silvery; dorsal fin whitish.

ι. Half-grown.

2. Coris giofredi.

Labrus giofredi, *Risso, Ichth. Nice,* p. 228. pl. 9. fig. 23.
Julis giofredi, *Risso, Eur. Mérid.* iii. p. 310; *Cuv. & Val.* xiii. p. 371. pl. 385; *Bonap. Faun. Ital. Pesc.* pl. fig. 2 (not good).

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 75–80. L. transv. 3/24.

The height of the body is one-fifth or a little less than one-fifth of the total, the length of the head rather more than one-fourth. Anterior dorsal spines not elevated. A black spot superiorly in the axil of the pectoral; operculum with a bluish-black spot; a dark band from the snout through the eye and the extremity of the opercle to the base of the caudal; sides of the body below the band and belly silvery, with a more or less distinct yellowish longitudinal band. Fins immaculate.

Mediterranean. South coast of England.

a. Adult. Madeira. Presented by J. Y. Johnson, Esq.
b. Adult. Azores. From the Collection of Madame Ida Pfeiffer.
c. Adult. Mediterranean.
d–g. Adult: stuffed. Lisbon. Purchased of Mr. Turner.
h, i, k. Many specimens. Malta.
l. Adult. Nice. From the Berlin Museum.
m–o. Adult and half-grown: skins. Leghorn. From Mr. Yarrell's Collection.
p, q, r. Half-grown. South Devonshire. Mus. Leach.
s. Adult.

3. Coris atlantica.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 75. L. transv. 4/25. Vert. 11/14.

The height of the body is two-ninths of the total length, the length of the head one-fourth. Anterior dorsal spines not elevated, increasing in length posteriorly, pungent; the sixth or seventh is the longest, two-fifths of the length of the head. Caudal rounded; the first ventral ray is much produced, not quite so long as the head, and extending backwards to the vent. *Colours in spirits*: olive, with two broad, dark longitudinal bands, one along the back, and darkest before the dorsal, the other from the pectoral to the middle of the root of the caudal; head with a narrow brown streak from the eye to the scapulary region, bifurcate posteriorly; a black spot at the extremity of the operculum. Dorsal and anal yellowish, with a narrow blackish edge, and with a broad violet band along the middle. Corners of the

caudal darker than the remainder of the fin; ventral filament blackish; no black spot in the axil.
Sierra Leone.

a. Fine specimen. Purchased of Mr. Stevens.
b–d. Adult. From the Collection of the Zoological Society.
e. Adult: skeleton. From the Collection of the Zoological Society.

4. **Coris multicolor.**

Halichœres multicolor, *Rüpp. N. W. Fische*, p. 15. taf. 4. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 55. L. transv. 5/20.

The height of the body is rather less than the length of the head, and two-ninths of the total. A posterior canine tooth. Caudal rounded; the anterior dorsal spine rather produced, the first ventral ray prolonged. Back with six broad brown cross-bands; one or three blue bands along the sides; dorsal with a black blotch anteriorly.

Var. *α*. Only one blue band, from the maxillary through the eye along the upper portion of the lateral line; the brown cross-bands extend downwards to the middle of the side; dorsal and anal fins with bluish longitudinal lines; the whole of the inferior side yellowish, with an interrupted yellow band from behind the axil.
Red Sea.

Var. *β*. Three blue bands along the anterior part of the body; the brown cross-bands extend downwards to the middle of the side; inferior side of the tail with an irregular deep-brown spot below the third cross-band. The soft dorsal with small spots; anal with lines.
New Hebrides.

a. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Var. *γ*. Three blue bands extending nearly to the caudal; the brown (violet during life) cross-bands reach downwards to the lower side, and the inferior extremity of the third band is deep blackish-brown. The soft dorsal with oblique violet streaks; anal with longitudinal lines.
New Hebrides.

b. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

5. **Coris variegata.**

Halichœres variegatus, *Rüpp. N. W. Fische*, p. 14. taf. 4. fig. 2.
Julis variegatus, *Cuv. & Val.* xiii. p. 462.
—— schrœderi, *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Amboina*, x. p. 3.
Hemicoris variegatus, *Bleek. Proc. Zool. Soc.* 1861, p. 411; *Synon. Labr.* p. 10, and *Atl. Ichth.* p. 106. tab. 36. fig. 4.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 52. L. transv. 6/22.

The height of the body equals the length of the head, and is somewhat more than one-fourth of the total. A posterior canine tooth. Caudal rounded; ventral pointed. A deep-blue spot behind the orbit; a small black ocellus, edged with white, anteriorly on the dorsal, and another larger one on the commencement of the soft portion. Brownish-green, with six white vertical streaks on the back, with irregular brown dots, and with fine undulated yellow lines along the upper part of the side. Cheek with three blue longitudinal lines.

Red Sea; Amboyna.

a. From Dr. Rüppell's Collection.

Bleeker's description of the colours differs considerably from Rüppell's: the Amboynese fish is red, with seven brown cross-bands on the back, broader than the interspaces of the light ground-colour between them; head with a reddish-violet band through the eye, and with a curved band of the same colour on the cheek and opercles. A reddish-violet band along the dorsal and anal fins; two black spots on the dorsal, as in the Red Sea fish.

The specimen in the British Museum has lost nearly all its colours.

6. Coris batuensis.

Julis batuensis, *Bleek. Batoe*, iii. p. 240.
Hemicoris batuensis, *Bleek. Syn. Labr.* p. 10, and *Atl. Ichth.* p. 107. tab. 36. fig. 3.

D. $\frac{9}{11}$. A. $\frac{3}{11}$. L. lat. 50.

The height of the body is contained four times and three-fourths in the total length, the length of the head five times, and that of the caudal five times and a half. A posterior canine tooth. Caudal truncated; the anterior dorsal spine shorter than the following; pectoral longer than ventral. Back violet, with some indistinct broad cross-bands; an oblique streak from the snout to the eye, and from behind the eye to the gill-opening. Dorsal fin anteriorly with a violet spot; pectorals with a violet band across the base. (*Bl.*)

Batoe.

7. Coris cuvieri.

Julis cuvieri, *Benn. Proc. Comm. Zool. Soc.* i. p. 128.
—— stellatus, *Cuv. & Val.* xiii. p. 499.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 80–85.

The height of the body is rather more than the length of the head, or than one-fourth of the total. A posterior canine tooth; upper lip broad, with folds; the lower not continuous with that of the other side, pendent. The anterior dorsal spine produced; caudal subtruncated; ventral long, pointed. Brownish-violet, with blue or green dots; head with three broad brownish-red bands. The inner half of the dorsal and anal fins with numerous irregular oblique violet lines, the outer half blackish-violet; caudal blackish-violet, with the basal portion lighter and dotted with blue. Dried specimens uniform brownish or blackish.

Mauritius. New Hebrides.

a. Adult. Mauritius. From the Collection of the Zoological Society. —Type of the species.

b. Adult: stuffed. Mauritius. From M. Desjardine's Collection.
c. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.
—Uniform blackish-violet.

8. **Coris gaimardi.**

Valent. fig. 337; *Renard,* ii. figs. 9, 59, 154.
Julis gaimardi, *Quoy & Gaim. Voy. Uran. Zool.* p. 265. pl. 54. fig. 1; *Cuv. & Val.* xiii. p. 500 (not synon.).
Coris gaimardi, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 387; *Bleek. Atl. Ichth.* p. 99. tab. 19. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 80.

The height of the body is rather more than one-fourth of the total length. A posterior canine tooth. Upper lip broad, with folds; the lower not continuous with that of the other side, pendent. The anterior dorsal spine produced; caudal subtruncated; ventral long, pointed. Carmine-red, darker anteriorly; tail with numerous blue dots, disposed in longitudinal series. A large yellow blotch behind the pectoral. A green undulated band from the orbit to the first dorsal spine; a blue curved band from one eye to the other; two violet bands on the side of the head; vertical fins yellow, with very small dots on the base; dorsal and anal fins with two or three blue lines along the margins; axil black.

Sandwich Islands. Timor.

a. Adult: skin. Copang. (=*Julis caudimacula*, var., Richards.)

9. **Coris pulcherrima.**

Valent. iii. p. 458. fig. 355; *Renard,* i. tab. 2. fig. 11.
Julis formosus, (*Swains.*) *Bleek. Celeb.* iv. p. 169 (not *Benn.*).
Coris formosa, *Bleek. Atl. Ichth.* p. 99. tab. 19. fig. 3.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 84.

The height of the body is one-fourth of the total length. No posterior canine tooth. Anterior dorsal spine produced; caudal rounded; ventral long, pointed. Head brownish-yellow; body brownish-violet, darker posteriorly; trunk with scattered small blue ocelli, which become more numerous on the tail, where they are disposed in irregular longitudinal series. A series of blue spots runs from the eye to the origin of the dorsal fin, and are more or less confluent into a narrow stripe; a single blue stripe along the median line of the forehead and nape; two broad reddish-violet bands on the side of the head. Fins yellow: dorsal and anal edged with blue and with two or three series of blue ocelli; axil black; ventral with the outer margin blue. Dorsal with a brown blotch anteriorly at the base.

Celebes, Amboyna, Tabitti. New Hebrides.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult. Tabitti. From Mr. Stutchbury's Collection.
c. Half-grown: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

10. Coris formosa.

Labrus formosus, *Benn. Fish. Ceyl.* no. 16.

D. $\frac{9}{12}$. A. $\frac{3}{12}$.

The anterior dorsal spines produced; *caudal rounded*; ventral long, pointed. Bluish-grey, with circular black spots; head yellow, with two oblique blue bands ascending towards the origin of the dorsal, one commencing from the snout and passing through the eye, the other parallel to the first, running below the eye. Dorsal and anal fins brown, the former with red margin, and with two green lines running within the red; black dots between the rays. Anal with a narrow green edge and a narrow green intramarginal line; a series of green dots within the margin. The inner half of the caudal red, the outer yellowish-white. (*Benn.*)

Ceylon.

11. Coris elongata.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 110.

The height of the body is one-sixth of the total length, the length of the head one-fourth; head nearly twice as long as high, with the snout pointed and nearly thrice as long as the orbit. Dorsal spines feeble and flexible, the anterior shorter than the posterior. Caudal slightly rounded; ventral much shorter than pectoral. No posterior canine tooth. Body and fins blackish-brown, head rather lighter; pectoral and posterior margin of the caudal transparent.

New Hebrides.

a. Seven inches and a half long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.
b. Seven inches and a half long. From the Haslar Collection.

12. Coris aygula.

Coris aygula, *Lacép.* iii. p. 96. pl. 4. fig. 1.
—— angulatus, *Lacép. l. c.* fig. 2.
Julis aygula, *Rüpp. Atl. Fische*, p. 25. taf. 6. fig. 3.
—— ruppelii, *Benn. Proc. Comm. Zool. Soc.* 1831, p. 128.
—— gibbifrons, *Quoy & Gaim. Voy. Astrol. Poiss.* p. 707. pl. 19. fig. 3.
—— coris, *Cuv. & Val.* xiii. p. 491.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 60–65. Vert. 9/16.

The height of the body equals the length of the head, and is contained thrice and three-fourths in the total length. A prominent hump on the nape of the neck, more developed in large than in young specimens. The posterior canine tooth is small, hidden, and appears to be sometimes entirely absent. The upper lip broad, with folds; the lower not continuous with that of the other side, pendent. The anterior dorsal spine produced; caudal subtruncated; ventral long, pointed. Black or blackish, sometimes with a light vertical band above the vent. Back and vertical fins with some blue dots. Three red angular cross-bands on the neck; edges of the præoperculum and operculum red; extremity of the operculum blue. Vertical fins with green margins. Dried specimens nearly uniform black.

Red Sea. Mauritius. Australia.

a. Nineteen inches long: stuffed. Red Sea. Presented by J. Burton, Esq.
b. Adult: stuffed. Red Sea. From Dr. E. Rüppell's Collection.
c. Twenty-three inches long: stuffed. India. From the Collection of the Zoological Society.
d. Adult: stuffed. Australia. From Mr. Gould's Collection.

13. **Coris annulata.**

Valent. fig. 308.
Labrus annulatus, *Lacép.* iii. pp. 455, 526. pl. 28. fig. 3.
—— semidiscus, *Lacép.* iii. pp. 429, 472. pl. 6. fig. 2.
—— doliatus, *Lacép.* iii. p. 429. pl. 6. fig. 3.
Hologymnosus fasciatus, *Lacép.* iii. p. 557. pl. 1. fig. 3; *Bleek. Proc. Zool. Soc.* 1861, p. 410, and *Atl. Ichth.* p. 96. tab. 20.
Julis rosea, *Quoy & Gaim. Voy. Astrol.* iii. p. 709, *Poiss.* pl. 15. fig. 1.
—— doliatus, *Cuv. & Val.* xiii. p. 504.
—— annulatus, *Cuv. & Val.* xiii. p. 501. pl. 388; *Bleek. Celeb.* viii. p. 311.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 120.

The height of the body is one-fifth of the total length, the length of the head two-sevenths; *the length of the pectoral is equal to, or rather less than, one-half of that of the head.* Posterior canine tooth none. Upper lip broad, folded; the lower broad, pendent, not continuous with that of the other side. Anterior dorsal spines not produced; caudal with two slight notches; *ventral pointed, not prolonged, much shorter than the pectoral. The upper part of the extremity of the suboperculum with an oblong black spot.* Body with vertical bands; head with rather irregular green bands.

Indian Ocean.

Var. *α*. Body with numerous darker vertical stripes, without distinct white cross-band. The basal half of the dorsal fin with large round whitish spots, each surrounded by a violet crescent posteriorly; the upper half with two or three longitudinal lines. Anal nearly uniform, with a fine intramarginal line.

a, *b*–*c*. Adult. Mauritius. From the Collection of the Zoological Society.
d. Adult: not good state. Seychelles. From the Haslar Collection.

Var. *β*. Body with numerous blue, brown-edged vertical stripes; a broad white cross-band, descending from between the third and eighth dorsal spines; a black band before the white one. Dorsal fin violet, with a series of low, semicircular white spots along the base; margin reddish-white, with a violet longitudinal line; anal with a series of light-violet rings along the base, with a broad light-violet band along the middle, and with the margin dark-violet.

e. Adult. Mauritius. From the Collection of the Zoological Society.

Var. *γ*. Rose-coloured, with the vertical stripes very indistinct. Mauritius.

14. **Coris cingulum.**

Labrus cingulum, *Lacép.* iii. p. 517. pl. 28. fig. 1.
Julis semipunctatus, *Rüpp. N. W. Fische*, p. 12. taf. 3. fig. 3.
Labrus aureo-maculatus, *Benn. Fish. Ceyl.* pl. 20.
Julis cingulum, *Cuv. & Val.* xiii. p. 428.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 60. L. transv. 6/28.

The height of the body equals the length of the head, and is one-fourth of the total. Posterior canine tooth none. Caudal rounded. The first ventral ray produced. Head and anterior part of the body brownish-olive, tail brown, both colours being separated by a pale cross-band which is situated at the end of the pectoral. Head with scattered small blue (brown) spots; a black spot on the extremity of the operculum, another superiorly at the axil.

Var. *α*. Back of the tail uniform dark-brown; vertical fins blackish-violet, with series of black spots and with white margins.
New Hebrides.

a. Adult: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

Var. *β*. Tail light-brownish-olive, with two large brown blotches on the back; basal half of the vertical fins light-brownish-olive, with brown dots, and separated by a brown band from the broad margin, which is yellowish.
Red Sea. Mauritius.

Var. *γ*. Like var. *β*, but the blotches on the back of the tail are red.
Ceylon.

15. **Coris semipartita.**

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 128.

The height of the body is contained four times and a half in the total length, the length of the head three times and three-fourths; *the length of the pectoral is more than one-half of that of the head.* Posterior canine tooth none; eye small, one-tenth of the length of the head. Dorsal spines flexible not produced, the ninth being the longest, one-third of the length of the head. Caudal fin crescent-shaped, the middle of the crescent being rather convex; *ventral pointed, slightly prolonged, its length being two-thirds of that of the pectoral.* Dark-greenish-olive in spirits, with numerous indistinct narrow vertical stripes, and with *a light-green vertical band on the middle of the distance of the snout from the base of the caudal,* below the two first soft dorsal rays. Head with a dark band from the orbit to the snout, with another from the orbit to the scapula, and with a third, short, horizontal, from below the lower margin of the orbit; a fourth from the orbit towards the occiput; operculum with a dark irregular blotch; subopercular flap with a black superior margin. Vertical fins dark violet: dorsal and anal with the margin yellow and with a bluish-black line within the margin; the soft dorsal and anal besides with a greenish (?) band along their outer half. The inner half of the caudal fin is yellow, this colour forming a crescent. Pectoral half-violet and half-yellow; a blackish line, running from the extremity of the fin towards the lower part of its axil, divides those two colours. Ventral yellow, violet towards its extremity.

Hab. ——?

a. Thirteen inches long. Mauritius? From the Collection of the Zoological Society.

16. **Coris longipes.**

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 120.

The height of the body is about one-fifth of the total length, the length of the head about one-fourth; *the length of the pectoral is nearly one-half of that of the head.* Posterior canine tooth none; eye small. Dorsal spines flexible, not produced, the ninth being the longest, one-third of the length of the head. Caudal subtruncated. *Ventral pointed, with the outer rays prolonged, as long as the pectoral.* Upper parts yellowish; sides greenish, with numerous narrow violet vertical stripes; *a blackish-violet ocellus below the lateral line,* covered by the extremity of the pectoral. A dark band runs from the orbit to the scapula; some dark blotches on the operculum. Dorsal and anal yellow, with a light and dark band along the margins; the soft dorsal with numerous minute ocelli. Basal portion of the caudal violet, with a broad yellow crescent behind. Pectoral and ventral uniform transparent.

New Hebrides.

a. Twelve inches long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

17. **Coris greenoughii.**

Valent. fig. 66; *Renard,* i. fig. 213, ii. figs. 5 & 71.
Julis greenovii, *Benn. Zool. Journ.* iv. p. 37.
—— leucorhynchus, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado & Macass.* p. 57.
Coris greenoughii, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 387; *Bleek. Atl. Ichth.* p. 100. tab. 31. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. ca 80.

The height of the body is two-ninths of the total length, the length of the head one-fourth. No posterior canine tooth; upper lip broad, folded; the lower pendent, not continuous with that of the other side. Caudal rounded; dorsal spines stiff, none of them produced. Pale cinnamon, with five straw-coloured, brown-edged markings across the upper side: the first square, on the extremity of the snout; the second oblong, between the posterior angles of the orbits; the three others extending on the dorsal fin.

Sandwich Islands, Celebes, Booroo.

a. Fine specimen. From Mr. Frembly's Collection.—Type of the species.

18. **Coris flavovittata.**

Julis flavovittatus, *Benn. Zool. Journ.* iv. p. 36.
—— eydouxii, *Cuv. & Val.* xiii. p. 455.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 80–85.

The height of the body is two-ninths of the total length, the length of the head one-fourth. No posterior canine tooth; upper lip broad, folded; the lower pendent, not continuous with that of the other side. Caudal rounded; dorsal spines stiff, none of them produced; ventral not much shorter than pectoral. Blackish-brown, with four yellow longitudinal bands, the second of which terminates at the bend of the lateral line; vertical fins with yellow margin, anal with a yellow band along the middle.

Sandwich Islands.

a. Fine specimen. From the Collection of the Zoological Society.—Type of the species.

19. **Coris oxyrhyncha.**

Julis oxyrhynchus, *Bleek. Boeroe,* ii. p. 74.
Hologymnosus oxyrhynchus, *Bleek. Synon. Labr. in Versl. Akad. Wet. Amsterd.* xiii. p. 281, and *Atl. Ichth.* p. 97. tab. 33. fig. 4.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 120.

The height of the body is one-seventh of the total length, the length of the head one-fourth; the length of the pectoral is more than one-half of that of the head. Posterior canine tooth none. Anterior dorsal spines not produced, caudal convex posteriorly, but with the angles acute; the length of the ventral is a little more than one-half of that of the pectoral. Yellowish-rosecoloured, with three brown longitudinal bands: the upper from the snout, along the upper part of the back, to the back of the tail; the second from the snout, through the eye, across the bend of the lateral line to the root of the caudal; the third is the broadest and runs from the snout across the thorax to the hind part of the caudal fin. (*Bl.*)

Sea of Kajeli.

20. **Coris caudimacula.**

Julis caudimacula, *Quoy & Gaim. Voy. Astrol.* iii. p. 710, *Poiss.* pl. 15. fig. 2; *Cuv. & Val.* xiii. p. 426.
Hemicoris caudimacula, *Bleek. Syn. Labr. in Versl. Akad. Wet. Amsterd.* xiii. p. 283, and *Atl. Ichth.* p. 106. tab. 36. fig. 2.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 50. L. transv. 4/18.

The length of the head is rather more than the height of the body, and one-fourth of the total. No posterior canine tooth. The first and second dorsal spines are somewhat produced; caudal rounded; ventral prolonged. Violet (in spirits), with four yellowish longitudinal bands, the second of which commences at the snout and passes through the eye; several other bluish streaks on the side of the head; a blue spot on the extremity of the operculum; a large black spot at the base of the caudal; dorsal fin with a blackish spot anteriorly and with two series of violet dots; anal with the base violet, and with two lines along the margin.

Mauritius. Coast of Mozambique.

a. Adult. Mozambique. From Prof. Peters's Collection.

21. **Coris auricularis.**

Cuv. & Val. xiii. p. 489; *Richards. Ann. & Mag. Nat. Hist.* 1843, xi. p. 422.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 78. L. transv. 6/28.

The height of the body equals the length of the head, and is contained four times and three-fourths in the total. No posterior canine tooth. Caudal rounded; dorsal and anal rather elevated, the spines being flexible and slender; the length of the posterior spines is two-thirds of that of the head. Uniform reddish-yellow (in a dried state); opercular point with a black spot, edged with white anteriorly; dorsal with a black spot between the two first spines and with numerous undulated brownish lines in its upper half; anal with three lines near the margin; caudal with irregular transverse bands.

Coasts of Western and Southern Australia.

a–d. Adult: stuffed and skins. Swan River. Presented by the Earl of Derby.
e–f. Adult: skins. Houtman's Abrolhos.
g. Adult: stuffed: not in good state.

22. **Coris heteroptera.**

Julis heteropterus, *Bleek. Act. Soc. Sc. Indo-Nederl.* ii. *Amboina*, viii. p. 78.
Pseudocoris heteropterus, *Bleek. Proc. Zool. Soc.* 1861, p. 411, and *Atl. Ichth.* p. 98. tab. 19. fig. 1.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 73.

The height of the body is contained thrice and three-fifths in the total length (the caudal lobes not included), the length of the head nearly five times; head as high as long. A posterior canine tooth. Dorsal spines slender, *the two anterior being produced and remote from the third*, a low membrane extending from the second to the third; caudal with the lobes produced into filaments; ventral much shorter than pectoral. Anterior part of the body brown to behind the axil, the remainder greenish, with eight black transverse bands, which are broader than the interspaces between; the anterior descends from the hinder dorsal spines; a blue spot on the membrane of the operculum; dorsal fin brownish-violet, edged with yellow; anal with a light band along the base; caudal yellow in the middle. (*Bl.*)

Amboyna.

23. **Coris lineolata.**

Julis lineolata, *Cuv. & Val.* xiii. p. 436.
—— cyanogramma, *Richards. Ann. & Mag. Nat. Hist.* vii. 1851, p. 289, and *Proc. Zool. Soc.* 1850, p. 73.
Ophthalmolepis lineolata, *Bleek. Proc. Zool. Soc.* 1861, p. 413.

D. $\frac{9}{13}$. A. $\frac{3}{13}$. L. lat. 55. L. transv. 4/25.

The height of the body is nearly equal to the length of the head.

and one-fourth of the total. A few small scales behind the orbit; a posterior canine tooth. Caudal rounded; ventral pointed; dorsal spines very slender and flexible. A broad light band, with a blackish one above or below, runs from the operculum to the caudal; body with longitudinal series of blue dots; head with curved blue transverse lines. Dorsal with four violet longitudinal lines and with a violet spot between the second and third spines.

Coasts of West Australia.

a. Adult: skin. Swan River.
b–g. Adult and half-grown: skins. Australia.
h. Half-grown. From the Haslar Collection.

36. CYMOLUTES.

Xyrichthys, sp., *Cuv. & Val.*
Novacula, sp., *Steindachner in Verhandl. Zool. Bot. Gesellsch. Wien*, 1861, p. 133.

Body compressed, oblong, covered with small scales; snout rather elevated; head naked; lateral line interrupted. No posterior canine tooth. Formula of the fins: D. $\frac{9}{12-14}$. A. $\frac{3\ (2)}{12-14}$.

Indian Seas. Western Pacific.

1. Cymolutes prætextatus.

Julis prætextata, *Quoy & Gaim. Voy. Astrol. Poiss.* p. 712. pl. 15. fig. 4; *Cuv. & Val.* xiii. p. 505.
Xyrichthys torquatus, *Cuv. & Val.* xiv. p. 54. pl. 392.
—— novaculoides, *Bleek. Amboina*, iii. p. 122.
Novacula xyrichthyoides, *Bleek. Natuurk. Tydschr. Nederl. Ind.* x. p. 488.
Cymolutes prætextatus, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 387; *Bleek. Atl. Ichth.* p. 146. tab. 31. fig. 1.

D. $\frac{9}{12}$. A. $\frac{3}{12}$. L. lat. 80.

Greenish, with a brownish-black, blue-edged band across the shoulder.

Celebes, Amboyna, Java, Mauritius.

a–b. Fine specimens. Amboyna. Purchased of Mr. Frank.

2. Cymolutes leclusii.

Xyrichthys lecluse, *Quoy & Gaim. Voy. Uran. Zool.* p. 284. pl. 65. fig. 1.
—— microlepidotus, *Cuv. & Val.* xiv. p. 52.

D. $\frac{9}{14}$. A. $\frac{3}{14}$. L. lat. 80.

Uniform brownish.

Sandwich Islands.

Fourth Group. PSEUDODACINA.

37. PSEUDODAX.

Odax, sp., *Cuv. & Val.* xiv. p. 305.
Pseudodax, *Bleek. in Versl. en Mededeel. Akad. Wetensch. Amsterd. Natuurk.* xii. 1861, *Scaroid.* p. 2 (sep. copy).

Body compressed, oblong, covered with scales of moderate size; lateral line continuous; cheeks and opercles scaly. Each jaw armed with two pairs of broad incisors and with a cutting lateral edge; teeth of the lower pharyngeal confluent pavement-like. Eleven dorsal spines.

East Indian Archipelago.

1. Pseudodax moluccensis.

Renard, i. pl. 2. no. 12; *Valent.* p. 350. fig. 10.
Odax moluccanus, *Cuv. & Val.* xiv. p. 305. pl. 408 (head); *Cuv. Règne Anim. Ill. Poiss.* pl. 91. fig. 3 (bad); *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manado en Makass.* p. 64; *Kner, Sitzgsber. Wien. Acad.* 1860, xl. p. 56. taf. 2. fig. 18 (pharyngeal apparatus).
Pseudodax moluccanus, *Bleek. Atl. Ichth.* p. 80. tab. 22. fig. 2, tab. 18. fig. 5.

D. $\frac{11}{12}$. A. $\frac{3}{14}$. L. lat. 32. L. transv. 4/12.

Dorsal and caudal with black reticulated lines; anal with four undulated blackish-violet longitudinal lines.

Celebes, Amboyna, and Java.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Fine specimen. Java. Purchased of Mr. Jamrach.
c. Adult: stuffed.

Fifth Group. SCARINA.

38. SCARUS*.

Scarus, sp., *Forsk.* p. 25.
Scarus, *Bleek. Versl. en Mededeel. Akad. Wetensch. Amsterd. Natuurk.* xii. 1861, *Scar.* p. 2.

The lower jaw projecting beyond the upper; a single series of scales on the cheek; dorsal spines stiff, pungent; the upper lip double in its whole circuit; anterior teeth soldered together, arranged in quincuncial order in mature specimens, and in oblique series in young ones; the dentigerous plate of the lower pharyngeal broader than long. D. $\frac{9}{10}$. A. $\frac{2}{8}$. L. lat. 21–23.

Mediterranean. Tropical parts of the Atlantic.

Skeleton (*Sc. aurofrenatus*).—The peculiar articulation of the jaw-

* 1. Scarus brachialis, *Poey, Mem. Cub.* ii. 1861, p. 345[1].—Cuba.
2. —— acroptilus, *Richards. Voy. Ereb. & Terr. Fishes*, p. 69.—Australia.

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[1] A few other new species of *Scarus* or *Pseudoscarus* are mentioned in Poey's List of Cuban Fishes. Unfortunately the sheets containing their descriptions are wanting in our copy of the work quoted, and have not been received yet, although ordered for some time.

bones, which I have mentioned in the description of the *Labrina* (p. 69), is found again in this group. The maxillary is strongly curved, and serves to form the junction between intermaxillary and palatine bone. There is a joint between the dentary and articulary parts of the mandible. The basioccipital has a pair of long grooves, in which the oblong condyles of the upper pharyngeals slide forwards and backwards. Occipital porous. Abdominal vertebræ eleven, caudal fourteen.

1. Scarus cretensis.

Σκάρος, *Arist. Hist. Anim.* ii. c. 17, viii. c. 2, 17, and *De Part. Anim.* iii. c. 14; *Athen.* vii. pp. 319, 320.
Scarus, *Plin.* ix. c. 17; *Ælian,* i. c. 2 & 4, ii. c. 54, xii. c. 42; *Ovid. Halieut.* v. 9, 119; *Oppian, Halieut.* I. v. 133, IV. v. 40, 113; *Colum.* viii. c. 16.
Scarus cretensis, *Aldrov.* p. 8.
Labrus cretensis, *L. Syst. Nat.* i. p. 474.
Scarus cretensis, *Cuv. & Val.* xiv. p. 164. pl. 400.
—— rubiginosus, *Cuv. & Val.* xiv. p. 171; *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 68.
—— mutabilis, *Lowe, Trans. Zool. Soc.* ii. p. 187.
—— canariensis, *Valenc. in Webb & Berthel. Iles Canar. Poiss.* pl. 17. fig. 2.

Purple, or purplish-brown, with a brownish shade on the front part of the body; the latter colour forms generally a blotch between the pectoral and the lateral line. Caudal fin slightly rounded, violet with a white margin.

Eastern and western parts of the Mediterranean; Madeira, Canary Islands.

a, b. Adult and half-grown. Mediterranean. From Mr. Petherick's Collection.
c, d. Adult. Madeira. Presented by the Rev. R. T. Lowe.
e, f, g. Adult and half-grown.

Vertebræ 11/14 (13/14, Valenciennes).

2. Scarus aracanga.

A series of three large scales on the cheek; teeth of moderate size, very distinct on the edges of the jaws. Dorsal spines rather slender, but pungent; caudal emarginate. Lateral line continuous; the tubes of each scale are much ramified and extend over the whole scale. Uniform dark purplish-violet.

Jamaica.

a. Ten inches long: skin. From Dr. Parnell's Collection.

3. Scarus abildgaardii.

Parra, lam. 28. fig. 2.
Sparus abildgaardii, *Bl.* taf. 259; *Bl. Schn.* p. 286; *Lacép.* iv. pp. 55, 163.
—— coccineus, *Bl. Schn.* p. 289.

Sparus aureo-ruber, *Lacép.* iv. pp. 56, 163, iii. pl. 33. fig. 3.
Scarus abildgaardii, *Cuv. & Val.* xiv. p. 175.

The snout is at least twice as long as the diameter of the eye. Caudal fin truncated in immature specimens, and forked in adult ones. Greyish- or brownish-olive (in a preserved state), each scale with narrow, very dark margins; membrane of the gill-opening black; axil without dark spot. Some scales with a whitish spot in the middle.

Atlantic coasts of tropical America.

a. Adult. South America. Presented by Sir R. Schomburgk.
b. Half-grown. Puerto Cabello. Purchased of Mr. Brandt.
c–o. Adult, half-grown, and young: stuffed and skins. Caribbean Sea.

4. Scarus catesbyi.

Psittacus piscis, *Catesb. Carol.* ii. tab. 29.
Scarus catesbæi, *Lacép.* iv. p. 16; *Cuv. & Val.* xiv. p. 183.
Callyodon psittacus, *Gronov. Syst. ed. Gray*, p. 84.

Caudal fin crescent-shaped, with the lobes much produced. Green, with a large white blotch at the root of the caudal; a brownish band proceeds from the angle of the mouth towards the opercular lobe, which has a yellow spot edged below with black; gill-membrane red; axil without black; pectoral dark green on its posterior half, a broad margin being transparent; anal green at the base and margin, brownish along the middle; caudal with a narrow red crescent, which is separated by a green band from the transparent posterior margin; upper and lower margins green.

West Indies.

a–c. Adult and half-grown: stuffed. West Indies. Purchased of Mr. Scrivener.
d. Adult. South America (? Barbadoes). Presented by Sir R. Schomburgk.
e. Adult: skin. From Gronow's Collection.

5. Scarus frondosus.

?? Scarus frondosus, *Cuv. & Val.* xiv. p. 204.

Caudal truncated. Olive (in spirits), with three indistinct light longitudinal bands: the upper along the lateral line to a white spot on the back of the tail, immediately behind the dorsal; the middle is straight and runs from the operculum, above the axil, to the middle of the root of the caudal; the lower along the side of the belly; base of the pectoral rather dark; fins punctulated with white, except the spinous dorsal, which is marbled with brownish. (Cfr. *Sc. rubripinnis.*)

Atlantic coasts of tropical America.

a. Seven inches long. Cuba. From the Collection of the Zoological Society.
b. Seven inches long: skin. Jamaica. From Dr. Parnell's Collection.
c. Head. Trinidad. Presented by J. B. Richardson, Esq.

d–f. Skins. West Indies. Purchased of Mr. Scrivener.
g. Young. Brazil. Mus. Leach.
h. Bleached.

Vertebræ 10/14.

6. Scarus rubripinnis.

Cuv. & Val. xiv. p. 199.

Caudal truncated. Violet-olive (in a dried state); fins, except the spinous dorsal, orange-coloured.

Caribbean Sea.

a. Eleven inches long: skin. West Indies. Purchased of Mr. Scrivener.

This is probably only the adult state of *Sc. frondosus.*

7. Scarus radians.

Cuv. & Val. xiv. p. 206.

Snout not twice as long as the diameter of the eye. Caudal truncated, with the outer rays slightly produced in mature specimens, rounded in young ones. Teeth very distinct, in young specimens in oblique series, in mature ones in a quincuncial arrangement. Pointed teeth directed outwards, round the upper jaw in young specimens. Four scales on the cheek. Tubules of the lateral line with three or four main branches, which in some scales are nearly simple, in others much branched. Reddish-olive, lower parts and anal rose-coloured; dorsal fin and upper parts marbled with brownish; caudal with irregular dark cross-bands, including whitish spots, and with a narrow whitish edge; anal with four oblique dark spots; root of the pectoral blackish; a light band across the chin.

Atlantic coasts of tropical America.

a–b. Fine specimens, seven inches long. Bahia. From Dr. O. Wucherer's Collection.
c–d. Fine specimens, four inches long. Bahia. From Dr. O. Wucherer's Collection.
e–i. From four to six inches long: skins. Jamaica. From Dr. Parnell's Collection.

8. Scarus chrysopterus.

Scarus chrysopterus, *Bl. Schn.* p. 286. pl. 57 (bad); *Cuv. & Val.* xiv. p. 185.
—— lateralis, *Poey, Mem. Cub.* ii. p. 219.

Caudal fin forked in adult, truncated in immature specimens. Blue, fins yellowish; caudal with a green band along the lobes, and a narrow posterior margin of the same colour. A black spot superiorly in the axil of the pectoral.

Caribbean Sea.

a. Adult. Martinique.

b–p. Adult, half-grown, and young: skins. Jamaica. From Dr. Parnell's Collection.
q–s. Adult and half-grown: stuffed. West Indies. Purchased of Mr. Scrivener.
t, u. Adult and half-grown. South America.
v. Half-grown: bad state. From the Haslar Collection.

9. **Scarus squalidus.**

Poey, Mem. Cub. ii. p. 218.

Caudal truncated, with the angles slightly produced. Rosy: pectoral with a large blackish blotch on its upper half. (*Poey.*)
Cuba.

10. **Scarus aurofrenatus.**

Cuv. & Val. xiv. p. 191.

Caudal fin truncated, with the lobes slightly produced. A yellow band proceeds from the hind part of the upper lip to the lower orbital margin, is interrupted on the operculum, and ascends in an oblique direction to the fifth or sixth scale of the lateral line, where it terminates; there is a small black spot above its end. Axil and membrane of the operculum without black. Anal with a violet margin; caudal with a broad whitish posterior margin, and with black corners.
Caribbean Sea.

a. Adult. Cuba. From Mr. Gerrard's Collection.
b–e. Adult: skins. Jamaica. From Dr. Parnell's Collection.
f. Adult: stuffed. Trinidad. Presented by J. B. Richardson, Esq.
g. Adult. West Indies. Purchased of Mr. Scrivener.
h–i. Adult and half-grown: skins. West Indies. Purchased of Mr. Scrivener.
k. Adult. South America. Presented by Sir R. Schomburgk.
l. Adult: skeleton (see p. 208). West Indies. Purchased of Mr. Scrivener.

11. **Scarus strigatus.**

Dorsal spines rather stout, the anterior not much longer than the orbit. Caudal fin slightly rounded. Lateral line not interrupted, each tube divided into many branches. Olive (in spirits); the scales forming the lateral line, those on the nape of the neck, and a few on the opercles, black, shining violet. The outer parts of the vertical fins violet; posterior part of the axil blackish-violet.
Hab. —— ?

a. Twelve inches long. Old Collection.

39. SCARICHTHYS.

Scarichthys, *Bleek. Versl. Akad. Wet. Amsterd.* xii. 1861, *Scar.* p. 2.

A single series of scales on the cheek; dorsal spines flexible; the upper lip double in its whole circuit; anterior teeth soldered together, those of the lower jaw disposed in very oblique series; the dentigerous plate of the lower pharyngeal broader than long. D. $\frac{9}{10}$. A. $\frac{2}{8}$. L. lat. ca 24. Scales of the back covering the base of the fin.

Indian Seas; tropical parts of the Pacific.

1. Scarichthys auritus.

Scarus auritus, (*Kuhl & van Hass.*) *Cuv. & Val.* xiv. p. 218.
—— vaigiensis, pt., *Quoy & Gaim. Voy. Freyc. Zool.* p. 288; *Cuv. & Val.* xiv. p. 214.
—— nævius, *Cuv. & Val.* xiv. p. 253; *Bleek. Celebes,* iii. p. 769.
Callyodon chlorolepis, *Richards. Voy. Sulph. Ichthyol.* p. 137. pl. 64. figs. 4–7.
Scarichthys auritus, *Bleek. Atl. Ichth.* p. 15. tab. 1. fig. 3.

Greenish, irregularly spotted with brown; cheek with two yellow cross-bands. Dorsal fin with a series of large brown spots; pectoral blackish at the base.

From the Seychelles to the New Hebrides.

a. Adult. From Dr. P. v. Bleeker's Collection.
b, c. Half-grown and young. Amboyna. Purchased of Mr. Frank.
d. Half-grown. Hongkong. Presented by Sir J. Richardson.—Type of *Callyodon chlorolepis.*
e. Twelve inches long: stuffed. Aneiteum. From Mr. Macgillivray's Collection.

2. Scarichthys cæruleopunctatus.

Scarus cœruleopunctatus, *Rüppell, N. W. Fische,* p. 24. taf. 7. fig. 3: *Cuv. & Val.* xiv. p. 262; *Bleek. Banda,* iii. p. 110.
—— bottæ, *Cuv. & Val.* xiv. p. 262.
Scarichthys cœruleopunctatus, *Bleek. Atl. Ichth.* p. 16. tab. 1. fig. 2.

Brownish-olive: head and body with numerous blue ocelli, edged with darker, one or more on each scale; fins yellowish or rosy, with small dots on the rays.

Red Sea. East Indian Archipelago.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

40. CALLYODON *.

Callyodon, (*Gronov.*) *Cuv. & Val.* xiv. p. 285.

A single series of scales on the cheek; dorsal spines flexible; anterior teeth imbricate, more or less distinct; the dentigerous plate of the lower pharyngeal broader than long. D $\frac{9}{10}$. A. $\frac{2}{8}$. L. lat. ca 24.

Seas between the tropics.

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* 1. Callyodon sandwicensis, *Cuv. & Val.* xiv. p. 295.—Sandwich Islands.
2. *Parra,* lam. 28. fig. 4.—Scarus flavescens, *Bl. Schn.* p. 290.—Callyodon flavescens, *Cuv. & Val.* xiv. p. 289.—West Indies.
3. Scarus dentiens, *Poey, Mem. Cub.* ii. 1861, p. 422.—Cuba.

1. Callyodon ustus.

Cuv. & Val. xiv. p. 286. pl. 405.

No other teeth within the front series of the upper jaw. Base of the dorsal free from scales *; caudal obtusely rounded. Brownish (in spirits), finely and irregularly marbled with darker; a blackish blotch on the anterior spines and on the base of the posterior rays of the dorsal fin; base of the pectoral without black.

Atlantic coasts of tropical America.

a. Adult. Trinidad. Presented by J. B. Richardson, Esq.
b. Half-grown: skin. Jamaica. From Dr. Parnell's Collection.
c, d. Adult. Bahia. Purchased of M. Parzudaki.

Vertebræ 25.

2. Callyodon auro-punctatus.

Cuv. & Val. xiv. p. 290.

Caudal fin subtruncated. Greenish: vertical fins with small rosy spots, more or less regularly arranged in oblique series; a reddish streak from the angle of the mouth to the eye, another on the cheek, and a third on the temple. (*Val.*)

San Domingo.

3. Callyodon viridescens.

Rüppell, N. W. Fische, p. 23. taf. 7. fig. 2.

No other teeth within the front series of the upper jaw. The dorsal scales cover the lower third of the fin. Caudal truncated, edged with white posteriorly. Green (during life), with brownish-black dots on the side of the trunk; two red streaks on the snout; dorsal and anal with oblique brown bands, the former with a blackish spot anteriorly between the tips of the two first spines.

Red Sea.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.

4. Callyodon carolinus.

? Callyodon carolinus, *Cuv. & Val.* xiv. p. 291.
Callyodon carolinus, *Bleek. Natuurk. Tydschr. Nederl. Ind.* 1859, xx. p. 444, and *Atl. Ichth.* p. 14. tab. 2. fig. 4.

No other teeth within the front series of the upper jaw. Base of the dorsal fin nearly free from scales; caudal rounded. The height of the body is two-sevenths of the total length. Violet, punctulated with red; vertical fins blackish-violet, caudal with a rosy posterior margin; pectoral with the base black.

Timor. (? Caroline Islands, Ceylon.)

a. Young: not good state. Ceylon. From the Collection of Messrs. von Schlagintweit.

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* Upper lip distinctly double in its entire circumference.

5. Callyodon genistriatus.

Cuv. & Val. xiv. p. 293; *Bleek. Banda,* iii. p. 111, and *Atl. Ichth.* p. 13. tab. 1. fig. 1.

No other teeth within the front series of the upper jaw; scaly sheath of the dorsal fin moderately high; caudal subtruncated. The height of the body is contained thrice and two-fifths in the total length. Brown, with small light spots; several red streaks radiate from the orbit; a violet spot between the first and second dorsal spines; dorsal with one, anal with two red longitudinal bands.

Celebes, Banda.

a. Adult: not good state. From Dr. P. v. Bleeker's Collection.

6. Callyodon brachysoma.

Bleeker, Atl. Ichth. p. 14. tab. 2. fig. 3.

No other teeth within the front series of the upper jaw. Scaly sheath of the dorsal fin moderately high. The height of the body is one-third or less than one-third of the total length. Reddish-brown, with irregular reddish dots and spots on the head, body, and vertical fins; a blackish spot between the first and second dorsal spines; root of the pectoral dark-brown.

Amboyna, Ternate.

a. Adult. From Dr. P. v. Bleeker's Collection.

7. Callyodon japonicus.

Callyodon japonicus, *Cuv. & Val.* xiv. p. 294. pl. 406; *Faun. Japon. Poiss.* p. 174. pl. 89; *Bleek. Verhand. Batav. Genootsch.* xxvi. *Nalez. Jap.* p. 115.
—— rubiginosus, *Cuv. Règne Anim. Ill. Poiss.* pl. 91. fig. 2 (bad).

Some small teeth within the front series of imbricate teeth. Dorsal fin with a scaly sheath at the base; caudal rounded. Violet-olive, with rosy spots and blue dots; dorsal and anal yellow, clouded with violet; caudal with violet margins; base of the pectoral violet.

Japan.

a. Adult. From Dr. P. v. Bleeker's Collection.

8. Callyodon spinidens.

Scarus spinidens, *Quoy & Gaim. Voy. Uran. Zool.* p. 289.
—— vaigiensis, pt., *Quoy & Gaim. l. c.* p. 288; *Cuv. & Val.* xiv p. 214.
Callyodon waigiensis, *Cuv. & Val.* xiv. p. 296.
—— hypselosoma, *Bleek. Amboina,* vi. p. 425.
—— spinidens, *Bleek. Atl. Ichth.* p. 13. tab. 2. fig. 2.

Small teeth within the front series of the upper jaw. The dorsal scales extend slightly on the base of the fin. Olive (in spirits), finely marbled with brown and yellow; vertical fins with brownish dots.

disposed in oblique or transverse series; dorsal and base of the pectoral without large blackish spot.

East Indian Archipelago. Waigiou.

a, b. Half-grown and young. Amboyna. Purchased of Mr. Frank.
c. Adult. Moluccas. Purchased of Mr. Frank.

9. Callyodon moluccensis.

Callyodon waigiensis, *Bleek. Banda,* i. p. 256.
—— moluccensis, *Bleek. Atl. Ichth.* p. 12. tab. 2. fig. 1.

Conical teeth within the front series of the upper jaw. The dorsal scales extend slightly on the base of the fin. Olive (in a preserved state), finely marbled with brown and yellow; a brownish blotch across the back, in front of the dorsal; vertical fins with reticulated lines; a black blotch between the second and third dorsal spines; base of the pectoral black.

East Indian Archipelago. New Hebrides.

a–b. Stuffed. Aneiteum. From Mr. Macgillivray's Collection.

41. CALLYODONTICHTHYS.

Callyodontichthys, *Bleek. Versl. en Mededeel. Akad. Wetensch. Amsterd. Natuurk.* xii. 1861, *Scar.* p. 2.

The lower jaw projecting beyond the upper; a single series of scales on the cheek; dorsal spines stiff, pungent; the upper lip double only posteriorly; teeth of the upper jaw soldered together, those of the lower distinct, disposed in oblique series. The dentigerous plate of the lower pharyngeal broader than long. D. $\frac{9}{10}$. A. $\frac{2}{8}$. L. lat. 25.

Tropical parts of the Atlantic.

This genus has been founded by Dr. v. Bleeker on a Scaroid fish from Bahia, named *Scarus flavescens,* in the Vienna Museum. I thought for some time I had recognized it in some fishes with the mandibulary teeth in distinct oblique series; but these have a narrow upper lip double in its whole circuit, and are merely the young of *Scarus radians.*

The name of *Sc. flavescens,* proposed by Schneider for a fish figured by Parra, lam. 28. fig. 4, cannot be retained for a species of the genus *Callyodontichthys.* Parra's representations of the Scaroid fishes are very faithful (much more so than the descriptions given by M. Valenciennes), and Parra evidently represents a species with slender and flexible dorsal spines, whilst *Callyodontichthys* has these spines pungent.

42. PSEUDOSCARUS *.

Scarus, sp., *Forsk.* p. 25.
Pseudoscarus, *Bleek. Versl. Akad. Wet. Amsterd.* xii. 1861, *Scar.* p. 3.

The upper jaw projecting beyond the lower; two or more series of scales on the cheek; dorsal spines more or less flexible; anterior teeth soldered together, arranged in quincuncial order; the dentigerous plate of the lower pharyngeal longer than broad. D. $\frac{9}{10}$. A. $\frac{2}{8}$. L. lat. 23–25.

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* 1. Scarus cretensis, *Bl.* t. 220.—Scarus striatus, *Cuv. & Val.* xiv. p. 209.—East Indies. [2

Seas between the tropics.

By far the greater portion of our knowledge of this genus is due to the labours of Dr. v. Bleeker, who first pointed out the characters by which the species may be determined. Valenciennes's descriptions, or rather notes, are so superficial, that it is impossible to recognize the species which have served him as types. The species of this genus are so numerous, and their distinctive characters really appear to depend so much on the colours, which rapidly fade after death, that it will always be very difficult to determine preserved specimens. Moreover the colours certainly change with age; and as the greater part of the species appear to attain to a very large size, we shall know only the immature state of many of them,—very large individuals being but rarely brought to this country and preserved in collections. We have admitted in our diagnoses the shape of the caudal fin, and

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2. Scarus rubronotatus, *Cuv. & Val.* xiv. p. 212. Red Sea.
3. —— trispinosus, *Cuv. & Val.* xiv. p. 182.—*Hab.* ——?
4. —— punctulatus, *Cuv. & Val.* xiv. p. 195.—Martinique.
5. —— flavo-marginatus, *Cuv. & Val.* xiv. p. 202.—Martinique.
6. —— mentalis, *Cuv. & Val.* xiv. p. 233.—Red Sea.
7. *Russell*, pl. 119.—Scarus russelii, *Cuv. & Val.* xiv. p. 234.—East Indies.
8. Scarus capistratus, (*K. & v. H.*) *Cuv. & Val.* xiv. p. 239.—Java.
9. —— scaber, *Cuv. & Val.* xiv. p. 239.—Mauritius.
10. —— ferrugineus, *Forsk.* p. 29; *Rüpp. Atl. Fische*, p. 79.—Red Sea.
11. —— cyanescens, *Cuv. & Val.* xiv. p. 254.—Mauritius.
12. —— variegatus, *Cuv. & Val.* xiv. p. 256.—Mauritius.
13. —— tæniurus, *Cuv. & Val.* xiv. p. 257.—Mauritius.
14. —— cyanurus, *Cuv. & Val.* xiv. p. 261.—Djetta.
15. —— bennettii, *Cuv. & Val.* xiv. p. 270.—Sandwich Islands.
16. —— scabriusculus, *Cuv. & Val.* xiv. p. 271.—Java.
17. —— arcuatus, *Cuv. & Val.* xiv. p. 276.—Siam.
18. —— purpureus, *Cuv. & Val.* xiv. p. 277.—Ulea.
19. —— cruentatus, *Cav. & Val.* xiv. p. 277.—Ulea.
20. —— spilurus, *Cuv. & Val.* xiv. p. 279.—Caroline Islands.
21. —— roseiceps, *Cuv. & Val.* xiv. p. 279.—Ulea.
22. —— frontalis, *Cuv. & Val.* xiv. p. 280.—Ualan.
23. —— mertensii, *Cuv. & Val.* xiv. p. 281.—Ulea.
24. —— festivus, *Cuv. & Val.* xiv. p. 282.—*Hab.* ——?
25. —— formosus, *Cuv. & Val.* xiv. p. 283.—Sandwich Islands.
26. —— nuchalis, *Poey, Mem. Cub.* ii. p. 220.—Cuba.
27. —— cœlestinus, *Cuv. & Val.* xiv. p. 180.—St. Thomas.
28. —— turchesius, *Cuv. & Val.* xiv. p. 181.—Porto Rico.
29. —— venosus, *Cuv. & Val.* xiv. p. 212.—Mauritius.
30. —— nigricans, *Cuv. & Val.* xiv. p. 213.—Red Sea.
31. —— cærulescens, *Cuv. & Val.* xiv. p. 230.—Red Sea.
32. —— lunulatus, *Cuv. & Val.* xiv. p. 268.—Red Sea.
33. —— forsteri, *Cuv. & Val.* xiv. p. 275.—Otaheiti.
34. —— lacrimosus, *Poey, Mem. Cub.* ii. 1861, p. 422.—Cuba.
35. —— humeralis, *Poey, l. c.*—Cuba.
36. —— distinctus, *Poey, l. c.* p. 423.—Cuba.
37. —— circumnotatus, *Poey, l. c.*—Cuba.
38. —— atomarius, *Poey, l. c.*—Cuba.

the presence or absence of pointed teeth near the angle of the mouth, as these characters appear to be constant in some species, whilst they certainly are subject to great variations in others.

Following the synopsis of the species given by Dr. v. Bleeker as our guide, we may divide the species as follows:—

A. Jaws whitish or rosy; upper lip broad, covering more than one-half of the upper jaw.
  a. Scales on the cheek in four series, p. 218.
  b. Scales on the cheek in three series, the lower præopercular limb being entirely naked, p. 219.
  c. Scales on the cheek in three series, the scales of the lower series covering the præopercular limb.
    * Snout with gay-coloured streaks running from the mouth to the eye, p. 220.
    ** Snout without longitudinal streaks, p. 227.
  d. Scales on the cheek in two series, p. 230.
  (*e.* Species insufficiently described, but belonging to division A, p. 232.)
B. Jaws green or blue; upper lip broad, covering at least one-half of the upper jaw, p. 233.
C. Jaws green or blue; upper lip narrow, covering less than one-half of the upper jaw.
  a. Scales on the cheek in three series, the lower præopercular limb being entirely naked, p. 235.
  b. Scales on the cheek in three series, the scales of the lower covering the præopercular limb, p. 236.
  c. Scales on the cheek in two series, p. 237.
  (*d.* Species insufficiently described, but belonging to division C, p. 237.)
D. Jaws whitish or rosy; upper lip narrow, covering only one-half, or less, of the upper jaw, p. 238.

A. Jaws whitish or rosy; upper lip broad, covering more than one-half of the upper jaw.

a. Scales on the cheek in four series.

1. Pseudoscarus superbus.

Parra, lam. 28. fig. 1 (very good).
Scarus superbus, *Poey, Mem. Cub.* ii. p. 218.

Four series of scales on the cheek, the lowest of which covers the limb of the præoperculum; the second composed of seven scales. Caudal subtruncated, with the angles more or less produced. Teeth very small, scarcely visible. Green (blue), each scale with a brownish centre and margin. A green, red-edged band from the lower margin of the orbit round the lower lip; chin green; upper lip red, with a short green cross-band; a green spot above the upper front angle of the orbit; two straight bands between the eye and the upper part of the gill-opening. Dorsal fin with a red band, running from the base of the first spine to the tip of the last ray, widening posteriorly;

anal with a similar broad band; upper and lower margins of the caudal red.

Caribbean Sea.

a. Adult. South America. Presented by Sir R. Schomburgk.
b–d. Adult: stuffed. West Indies. From Mr. Scrivener's Collection.

2. Pseudoscarus acutus.

Scarus acutus, *Poey, Mem. Cub.* ii. p. 216.

Four series of scales on the cheek, the lower of which covers the præopercular limb; the third composed of seven scales. Lips broad; jaws white, the upper with pointed teeth at the angle; teeth small. Posterior margin of the caudal undulated; fourteen pectoral rays. Olive, without gay-coloured streaks or margins of the fins; a very broad whitish band from behind the pectoral to the caudal.

Cuba.

a. Adult: stuffed. Caribbean Sea. Purchased of Mr. Scrivener.

3. Pseudoscarus bicolor.

Callyodon, sp., *Gronov. Zoophyl.* no. 245.
Scarus bicolor, *Rüpp. Atl. Fische*, p. 82. taf. 21. fig. 3.
Callyodon scriptus, *Gronov. Syst. ed. Gray*, p. 85.
Pseudoscarus bicolor, *Bleek. Atl. Ichth.* p. 33. tab. 14.

Three series of scales on the cheek, and two scales on the lower præopercular limb; the two middle series composed of six or five scales. Upper lip broad, double in its entire circuit; jaws rosy, rough, without pointed teeth at the angle. Dorsal spines subequal in length; fourteen pectoral rays. Back rose-coloured; sides and lower parts dark-violet, uniform or variegated with rosy, and spotted with black.

Red Sea. Celebes.

a. Adult: stuffed. Red Sea. From Dr. Rüppell's Collection.
b. Adult: skin. From Gronow's Collection.

b. Scales on the cheek in three series, the lower præopercular limb being entirely naked.

4. Pseudoscarus pulchellus.

Scarus pulchellus, *Rüppell, N. W. Fische*, p. 25. taf. 8. fig. 3, and *Verz. Fische Senckenb. Mus.* p. 21; *Cuv. & Val.* xiv. p. 266; *Bleek. Java*, ii. p. 440.
Pseudoscarus pulchellus, *Bleek. Atl. Ichth.* p. 34. tab. 10. fig. 3.

Three series of scales on the cheek, the lower præopercular limb being entirely naked; the middle series is composed of six scales, the lower of two or more. Upper lip broad. Jaws white, teeth rather small. Dorsal spines subequal in length; caudal truncated, with the lobes more or less produced in adult specimens; fourteen pectoral rays. Green, each scale with a red vertical streak; head and anterior portion of the trunk with numerous, small, round red spots. A red, green-edged band from the lower lip to the base of the pectoral; fins edged with green; dorsal spines green inferiorly and red superiorly; caudal red, with a broad green crescent on its hind margin.

Red Sea, Mauritius, Java, Celebes.

a. Three feet long: stuffed. Mauritius.

? *b*. Bad state. China. Presented by Sir J. Richardson.

5. **Pseudoscarus harid.**

Scarus harid, *Forsk.* p. 30; *Rüpp. Atl. Fische,* p. 80. taf. 21. fig. 1.
—— ruppelii, *Cuv. & Val.* xiv. p. 259.
—— mastax, *Rüppell, Atl. Fische,* p. 80. taf. 21. fig. 2, and *N. W. Fische,* p. 28; *Cuv. & Val.* xiv. p. 246; *Bleek. in Natuurk. Tydschr. Nederl. Ind.* 1854, p. 199.
? Scarus longiceps, *Cuv. & Val.* xiv. p. 241.
Pseudoscarus mastax, *Bleek. Atl. Ichth.* p. 35. tab. 10. fig. 1.

Snout produced. Three series of scales on the cheek, the lower præopercular limb being naked. Upper lip entirely covering the jaw, double in its entire circuit; jaws whitish, with pointed teeth at the angle. Anterior dorsal spines shortest; caudal lobes much produced; fifteen pectoral rays. Greenish: two short red streaks before and behind the eye; upper lip red, with a blue cross-band; a red band from the upper lip to the præoperculum and thorax. Vertical fins blue-edged; dorsal and anal with a series of green spots, which are sometimes confluent into a band.

There appear to be two varieties:—

α. Three series of blue spots on the side above the vent; caudal edged with greenish posteriorly, without cross-bands.—Red Sea.

a. Adult: stuffed. Djetta. From Dr. E. Rüppell's Collection.

β. Caudal with two green cross-bands.—Java, Kokos.

b. Large specimen. From Dr. P. v. Bleeker's Collection.

Vertebræ 11/13.

c. Scales on the cheek in three series, the scales of the lower series covering the præopercular limb.

* Snout with gay-coloured streaks running from the mouth to the eye.

6. **Pseudoscarus viridis.**

Scarus viridis, *Bl.* taf. 222 (good); *Bl. Schn.* p. 286.
—— frenatus, *Lacép.* iv. p. 13. pl. 1. fig. 2; *Cuv. & Val.* xiv. p. 227; *Bleek. Celebes,* iii. p. 770.
—— blochii, *Cuv. & Val.* xiv. p. 219.
Pseudoscarus frenatus, *Bleek. Atl. Ichth.* p. 40. tab. 16. fig. 2.

Two series of scales on the cheek, and a single scale on the lower præopercular limb, near the angle; the middle series composed of seven scales. Upper lip broad; jaws whitish, the lower with a strong horizontal pointed tooth near the angle; teeth small. Dorsal spines subequal in length; caudal truncated; fourteen pectoral rays. Head and trunk reddish-olive, tail green. The green colour of the upper lip is continued into a band running through the lower part of the orbit to the angle of the operculum; two stripes across the lower lip; a green band from the chin to the vent. Nape of the neck with a green band, continued into a series of spots along the base of the dorsal; lower half of the dorsal violet, upper red, both colours separated by a green line; margin of the dorsal and the upper and lower rays of the caudal green; anal green, with a broad red band.

Louisiade Archipelago. Celebes.

a. Adult: stuffed. Louisiade Archipelago.
b. Fine specimen. From Dr. P. v. Bleeker's Collection.—(*Ps. frenatus.*)

I can scarcely doubt that the species described is identical with *Scarus viridis*, Bloch, and that *Pseudoscarus viridis* of Bleeker is a different species. Prof. Peters having at my request examined Bloch's typical specimen, writes that the latter (a half skin) has been very faithfully drawn by Bloch, although Valenciennes says the contrary. In that specimen the band below the eye is continued on to the end of the operculum, and the lower series of scales on the cheek is composed of seven scales, and not of five as in *Ps. viridis*, Bleek. The latter character is also in accordance with the form of the head, which is more obtuse in *Ps. viridis*, Bleek., than in *Sc. viridis*, Bloch.

7. **Pseudoscarus chrysopoma.**

Scarus quoyi, part., *Cuv. & Val.* xiv. p. 273.
—— chrysopomus, *Bleek. Verhand. Batav. Gen.* xxii. *Labr. Cycl.* p. 53.
Pseudoscarus viridis, *Bleek.* (not *Bloch*) *Atl. Ichth.* p. 45. tab. 17. fig. 2.

Three series of scales on the cheek, the lower of which covers the præopercular limb; the middle is composed of five scales, the lower of two or three. Upper lip broad; jaws rosy, with a pointed tooth at the angle. Dorsal spines subequal in length; caudal truncated, with the angles slightly produced in adult specimens; fourteen pectoral rays. Green: scales with a reddish margin; upper lip with one, the lower with two cross-bands, passing into a subtriangular spot between the orbit and the angle of the mouth; three short lines radiate from the eye. Dorsal and anal rosy, with a narrow band along the base, and with greenish margins; caudal green.

East Indies.

a, b. Fine specimens. From Dr. P. v. Bleeker's Collection.

8. **Pseudoscarus dimidiatus.**

Scarus dimidiatus, *Bleek. Act. Soc. Sc. Indo-Nederl.* vi. *New Guinea*, p. 17.
Pseudoscarus dimidiatus, *Bleek. Atl. Ichth.* p. 41. tab. 16. fig. 1.

Three series of scales on the cheek, the lower of which is composed of five scales and covers the præopercular limb. Upper lip broad; jaws rosy, without pointed teeth at the angle. Dorsal spines subequal in length; caudal convex or subtruncated; thirteen pectoral rays. Green on the anterior half, coffee-brown on the posterior; a greenish-yellow band commences at the angle of the mouth, and descends from the inferior margin of the eye towards the base of the pectoral; the part behind the eye has a broad brown edge superiorly and a narrow reddish one inferiorly. Dorsal red, with a bluish band along the margin and a green one along the middle; anal red at the base and blue on the margin; caudal with a broad greenish margin; pectoral without spot at the axil. (*Bl.*)

New Guinea.

9. **Pseudoscarus javanicus.**

Scarus javanicus, *Bleek. Natuurk. Tydschr. Nederl. Ind.* vi. p. 198.
Pseudoscarus javanicus, *Bleek. Atl. Ichth.* p. 36. tab. 11. fig. 3.

Three series of scales on the cheek, the lower composed of three scales and covering the præopercular limb. Upper lip broad; jaws whitish, with pointed teeth at the angle. The anterior dorsal spines are longer than the posterior; caudal emarginate; fourteen pectoral rays. Rosy anteriorly, green posteriorly; eye surrounded by red streaks which radiate from its orbit; lower lip with two green cross-bands. Dorsal fin brownish-violet along the base, green along the middle, with a blue margin, and with a red longitudinal band below the margin; anal rosy, blue along the base and margin; caudal blue, green posteriorly, with a red band along the upper and lower margins. (*Bl.*)

Java.

10. **Pseudoscarus rivulatus.**

Scarus fasciatus, *Cuv. & Val.* xiv. p. 222.
—— rivulatus, *Cuv. & Val.* xiv. p. 223.
—— rivulatoides, *Bleek. Verhand. Batav. Gen.* xxii. *Labr. Cycl.* p. 55.
—— micrognathus, *Bleek. l. c.* p. 56.
Pseudoscarus rivulatus, *Bleek. Atl. Ichth.* p. 44. tab. 9. fig. 3.

Two series of scales on the cheek and two scales on the lower præopercular limb; the middle series composed of six scales. Upper lip broad. Jaws whitish, each with two small pointed teeth at the corner; teeth of moderate size. Anterior dorsal spine shortest; fourteen or fifteen pectoral rays*; caudal subtruncated. Green, each scale with a reddish margin; snout and the lower half of the head reddish, the former with rather numerous undulated green lines. A narrow green band along the base and margin of the dorsal fin, and an irregular band of the same colour, or series of spots, along its middle. Anal green, lighter towards the margin, which is broadly edged with dark-green. Caudal with irregular green spots.

East Indies.

a. Adult: skin.
b. Half-grown: stuffed. From the Collection of the East India Company.

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* Bleeker states fourteen; the specimen in the British Museum has fifteen.

11. Pseudoscarus pyrrhostethus.

Scarus psittacus, *Forsk.* p. 29; *Shaw, Zool.* iv. p. 397; *Rüpp. Atl. Fische*, p. 77. taf. 20. fig. 1; *Cuv. & Val.* xiv. p. 226; *Cant. Catal.* p. 239; (not *Coryphæna psittacus*, L.).
Scarus pyrrhostethus, *Richards. Ichth. Chin.* p. 262.
—— harid, *Cuv. & Val.* xiv. p. 247 (part.) pl. 404; *Cuv. Règne Anim. Ill. Poiss.* pl. 91. fig. 1; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 48 (not *Forsk.*).
—— haridoides, *Bleek. Enumer.* p. 104.
Pseudoscarus pyrrhostethus, *Bleek. Atl. Ichth.* p. 42. tab. 9. fig. 1.

Two series of scales on the cheek and two scales on the lower præopercular limb; the middle series composed of five scales. Upper lip broad; jaws whitish; teeth small. Dorsal spines subequal in length; caudal truncated, with the lobes produced in old age; fifteen pectoral rays. Head reddish, scales of the body blue with red margins; lips with a blue cross-band; a curved blue streak from the angle of the mouth to below the eye, vertical fins red, with blue base and margins, without band along the middle; caudal sometimes spotted with blue.

East Indian Seas. Red Sea.

a. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—Type of the species.
b. Adult: skin. Pinang.—Type of *Scarus psittacus*, Cant.
c–d. Adult: skins. Ceylon. From Dr. Kelaart's Collection.
e–f. Adult and half-grown. From the Haslar Collection.

We consider *Ps. cantori*, Bleek., as a variety of this species, which has round blue spots not only on the caudal, but also on the dorsal fin. Its synonymy is—

Scarus pepo, *Benn. Fish. Ceyl.* pl. 28.
—— psittacus, *Bleek. Batav.* p. 495 (not *Cant.*).
Pseudoscarus cantori, *Bleek. Versl. en Meded. Akad. Wetensch Nat. Amsterd.* xii. 1861, *Scar.* pp. 12, 13, and *Atl. Ichth.* p. 43. tab. 9. fig. 2.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

12. Pseudoscarus maculosus.

Sonnerat, in Rozier, Journ. Phys. 1774, iii. p. 227. tab. 2.
Scarus maculosus, *Lacép.* iv. pp. 5, 21. pl. 1. fig. 3; *Cuv. & Val.* xiv. p. 235.
—— guttatus, *Bl. Schn.* p. 294.

Two series of scales on the cheek and a single scale on the lower præopercular limb; the middle series composed of five scales. Upper lip broad; jaws whitish, without pointed teeth at the angle. Dorsal spines subequal in length; fifteen pectoral rays; caudal somewhat convex, with the angles produced. Yellowish, head and body with irregular blue spots; vertical fins edged with blue and with blue spots along their base.

Mauritius, Mozambique.

a–b. Half-grown: not good state. From the Haslar Collection.
c. Young. Mozambique. From Prof. Peters's Collection.

13. Pseudoscarus dussumieri.

?? Scarus dussumieri, *Cuv. & Val.* xiv. p. 252.
? Scarus dussumieri, *Bleek. Batavia,* p. 494.
Pseudoscarus dussumieri, *Bleek. Versl. en Meded. Akad. Wetensch. Natuurk. Amsterd.* xii. 1861, *Scar.* pp. 13, 14, and *Atl. Ichth.* p. 46. tab. 8. fig. 1.

Two series of scales on the cheek and two scales on the præopercular limb. Upper lip broad; jaws whitish, the upper with pointed teeth at the angle. Dorsal spines equal in length; fourteen pectoral rays. Greenish: two green streaks from the mouth to the eye; another green band between the eyes; vertical fins edged with blue, without band along the middle.

Java.

a. Adult. From Dr. P. v. Bleeker's Collection.

14. Pseudoscarus lepidus.

Scarus lepidus, *Jenyns, Zool. Beagle, Fish.* p. 108.

Three series of scales on the cheek, the lower of which is composed of four scales, the middle of seven. Upper lip broad, with the inner portion well developed. Jaws whitish, the lower with a horizontal pointed tooth at the angle, the upper without such a tooth. Teeth small. Dorsal spines subequal in length, rather stout, flexible at the top. Caudal fin emarginate; thirteen pectoral rays. Brown (in spirits), with some purplish streaks on the snout.

Tahiti.

The diagnosis has been taken from the typical specimen in the Collection of the Philosophical Society of Cambridge.

15. Pseudoscarus hypselopterus.

Scarus hypselopterus, *Bleek. Batavia,* p. 496.
Pseudoscarus hypselopterus, *Bleek. Atl. Ichth.* p. 36. tab. 8. fig. 3.

Three series of scales on the cheek, the lower of which covers the præopercular limb and is composed of three scales. Upper lip broad; jaws whitish, the upper with pointed teeth at the angle. Anterior dorsal spines longer than the posterior; caudal rounded, with the lobes slightly produced; fourteen pectoral rays. Greenish anteriorly, yellow posteriorly; two fine red streaks between eye and jaws; chin with two blue cross-stripes. Vertical fins red, edged with blue; anal blue at the base; a brown spot at the base of the pectoral. (*Bl.*)

Java.

16. Pseudoscarus globiceps.

Scarus globiceps, *Cuv. & Val.* xiv. p. 179; *Jen. Voy. Beagle, Fishes,* p. 106.

Two series of scales on the cheek and one or two scales on the lower præopercular limb; the middle series composed of six scales.

Upper lip broad, with the inner portion well developed; jaws whitish; a strong pointed horizontal tooth at the corner of the upper jaw, and a pair of similar teeth at the corner of the lower. Teeth of moderate size. Dorsal spines subequal in length, stout, with the top flexible; caudal emarginate; fourteen pectoral rays. Greyish-olive above; the lower parts of the head yellowish, to an oblique line running from the axil through the lower margin of the orbit and the upper lip. A curved yellow band passes from one eye across the snout to the other; short streaks radiate from the hinder and upper part of the orbit. The dark-coloured portion of the head edged with yellow and dotted with whitish. Each scale on the body with four or five round whitish dots. A small black ocellus on the scale covering the base of the fourth dorsal spine. Dorsal fin yellowish, with two fine, undulated violet lines, one along the base and the other near the margin; a series of ocelli along the middle of the soft portion. Anal yellow, with a single line below the middle; caudal with a yellow, dark-edged band along each lobe; pectoral blackish at the root, and with an elongate-ovate dark spot on its upper half.

Tahiti.

a. Fine specimen. From the Collection of the Zoological Society.

17. Pseudoscarus oviceps.

Scarus oviceps, *Cuv. & Val.* xiv. p. 244.

The head is one-third less high than long, and has its profile slightly curved. Jaws without pointed teeth. Caudal lobes much produced. Upper part of the head brownish-violet (in spirits), the lower yellowish, both colours being well defined by a line running from above the upper lip, through the lower margin of the orbit and the angle of the præoperculum, to the ventrals. Body brownish-violet. with an irregular oblique yellowish band between the middle of the dorsal fin and the point of the pectoral; there is a spot of the same colour on the posterior quarter of the dorsal and on the back. (*Val.*)

Tahiti.

18. Pseudoscarus psittacus.

Coryphæna psittacus, *L. Syst. Nat.* i. p. 448; *Bl. Schn.* p. 296.
Scarus vetula, *Bl. Schn.* p. 289; *Cuv. & Val.* xiv. p. 193.

Three series of scales on the cheek, the lowest of which covers the limb of the præoperculum; the middle composed of seven scales. Caudal subtruncated. Teeth small. Green: upper part of the head and nape reddish; a broad yellow band commences immediately above the pectoral, and runs in a slightly oblique upward direction nearly to the middle of the tail; head with two straight green longitudinal bands: the upper round the snout, through the upper margin of the orbit, to the origin of the lateral line; the lower round the upper lip, through the lower margin of the orbit, to the opercular lobe; another short transverse band round the chin. Dorsal fin green, with a broad yellow longitudinal band near its upper margin; anal with a similar band, commencing at the base of the front spine, and terminating near the tip of the last ray; caudal green, with the upper and lower margins yellow.

Caribbean Sea.

a. Fine specimen. Cuba. From the Collection of the Zoological Society.
b. Adult: skin. Jamaica. From Dr. Parnell's Collection.
c. Adult. South America. Presented by Sir R. Schomburgk.
d–e. Adult: stuffed. West Indies. Purchased of Mr. Scrivener.
f. Adult: skeleton. Cuba. From Mr. Gerrard's Collection.

Vertebræ 12/13. In this species the dentary bone of the mandibula is still more separate from the articulary than in *Scarus aurofrenatus*, the joint between both bones being very narrow. A good figure of this peculiar structure of the mandible is given in Cuvier and Valenciennes, Hist. Nat. Poiss. pl. 404.

19. Pseudoscarus tæniopterus.

Scarus tæniopterus, (*Desm.*) *Cuv. & Val.* xiv. p. 195.
? Scarus diadema, *Cuv. & Val.* xiv. p. 198.

Three series of scales on the cheek, the lowest of which covers the limb of the præoperculum; the middle composed of five scales. Caudal truncated. Teeth small. Olive (in a preserved state): a yellow band descends from the upper posterior angle of the orbit towards the middle of the side, and is lost at the end of the trunk; there is a dark band immediately below, which takes its origin from the hind margin of the orbit, is edged with green on the head, descends to above the root of the pectoral, and is lost at the end of the trunk; the parts below the dark band are yellow. There are two green streaks on each side of the snout, and one round the lips. A narrow band along the edge and base of the dorsal and anal is green, all the remainder of those fins being yellowish, with green spots. The upper and lower margins of the caudal green.

Caribbean Sea.

a. Half-grown. Trinidad. Presented by J. B. Richardson, Esq.
b. Half-grown. West Indies. Purchased of Mr. Scrivener.
c–e. Adult and half-grown: stuffed and skins. West Indies. Purchased of Mr. Scrivener.

20. Pseudoscarus sanctæ crucis.

Scarus croicensis, *Bl.* taf. 221.
—— insulæ sanctæ Crucis, *Bl. Schn.* p. 285.
—— alternans, *Cuv. & Val.* xiv. p. 200.

Three series of scales on the cheek, the middle composed of five scales, the lower of three and covering the limb of the præoperculum. Caudal subtruncated. Teeth small. Silvery, with three red (brownish in spirits) longitudinal bands: the upper from the nape of the neck to the end of the dorsal; the second through the eye, crossing the space between the two portions of the lateral line; the third from the base of the pectoral to the lower half of the caudal fin.

Caribbean Sea.

a–h. Adult (8 inches long) and half-grown: skins. Jamaica. From Dr. Parnell's Collection.

i. Half-grown. Trinidad. Presented by J. B. Richardson, Esq.

k. Half-grown. Puerto Cabello. Purchased of Mr. Brandt.

** Snout without longitudinal streaks.

21. Pseudoscarus chloris.

Parra, lam. 28. fig. 3.
Scarus chloris, *Bl. Schn.* p. 289.
? Scarus virens, *Cuv. & Val.* xiv. p. 203.
Scarus quadrispinosus, *Cuv. & Val.* xiv. p. 197.
? Scarus obtusus, *Poey, Mem. Cub.* ii. p. 217.

Two series of scales on the cheek and two scales on the lower limb of the præoperculum; the second series is composed of four scales. Caudal rounded, with the lobes produced; fifteen pectoral rays. Teeth very small. Nearly uniform green; vertical fins edged with dark green; nape or opercles sometimes reddish. Sometimes uniform brownish (*Scarus quadrispinosus*).

Caribbean Sea.

a–c. Adult and half-grown: skins. Jamaica.

Brown variety (*Scarus quadrispinosus*):

d. Half-grown: skin. Jamaica.

22. Pseudoscarus cæruleus.

Parra, lam. 27. figs. 1, 2.
Novacula cærulea, *Catesby, Carol.* pl. 18.
Coryphæna cærulea, *Bl.* taf. 176 (very bad); *Bl. Schn.* p. 295; *Lacép.* iii. p. 175.
Scarus loro, *Bl. Schn.* p. 288.
—— cæruleus, *Bl. Schn.* p. 288; *Cuv. & Val.* xiv. p. 186. pl. 401.
—— trilobatus, *Lacép.* iv. p. 21.
? Sparus holocyanosus, *Lacép.* iv. p. 45.

A rounded prominent hump above the snout. Jaws whitish. Caudal with the lobes produced. Uniform blue.

Caribbean Sea.

This is very probably the old state of one of the other species, perhaps of *Ps. chloris*.

23. Pseudoscarus aracanga.

Two series of scales on the cheek and two scales on the lower præopercular limb; the middle series is composed of six scales. Lips

broad; jaws rosy, the upper with two or three small pointed prominences at the angle; teeth small. Dorsal spines flexible; caudal truncated; fourteen pectoral rays. Tubes of the lateral line simple; lateral line interrupted. Uniform violet-purple; vertical fins very dark.
Jamaica.

a. Seven inches long: skin. From Dr. Parnell's Collection.

This species has exactly the same coloration as *Scarus aracanga*, with which it may be easily confounded.

24. Pseudoscarus capitaneus.

Cacatoe-capitano, *Renard*, pl. 20. fig. 112.
Scarus enneacanthus, *Lacép.* iv. pp. 2, 6.
—— denticulatus, *Lacép.* iv. pp. 3, 12. pl. 1. fig. 1.
—— chadri, *Lacép.* iv. pp. 2, 11.
—— capitanus, *Cuv. & Val.* xiv. p. 228. pl. 403.

Two series of scales on the cheek and two scales on the lower præopercular limb; the middle series composed of six scales. Upper lip broad; jaws whitish. Anterior dorsal spine shortest; fifteen pectoral rays; caudal rounded in young specimens and emarginate in adult ones. Blue, vertical fins edged with lighter.
Mauritius. Mozambique.

a. Young. Mozambique. From Prof. Peters's Collection.

25. Pseudoscarus balinensis.

Scarus balinensis, *Bleek. Verhand. Batav. Genootsch.* xxii. *Bali*, p. 8.
Pseudoscarus balinensis, *Bleek. Atl. Ichth.* p. 39. tab. 16. fig. 3.

Three series of scales on the cheek, the lower of which covers the præopercular limb. Upper lip broad, entirely covering the jaw; jaws rosy, with pointed teeth at the angle, in adult specimens. Dorsal spines equal in length; caudal rounded; fourteen pectoral rays. Body olive; fins rosy, edged with blue. (*Bl.*)
Bali, Banda.

a. Young: not good state. From Dr. P. v. Bleeker's Collection.

26. Pseudoscarus macrochilus.

Scarus macrocheilos, *Bleek. Gilolo*, p. 60.
Pseudoscarus macrocheilos, *Bleek. Atl. Ichth.* p. 38. tab. 15. fig. 1.

Three series of scales on the cheek, the lower of which is composed of four scales and covers the præopercular limb. Upper lip broad, entirely covering the jaw; jaws rosy, without pointed teeth at the angle. Anterior dorsal spine shortest; fifteen pectoral rays; caudal subtruncated. Head and fins without bands; head, anterior part of the back and front portion of the dorsal violet, the remainder of the body and fins yellowish; upper and lower edges of the caudal violet. (*Bl.*)
Halmaheira.

27. Pseudoscarus dubius.

Scarus dubius, *Benn. Zool. Journ.* iv. p. 37.

Two series of scales on the cheek and two scales on the lower præopercular limb; the middle series composed of five scales. Upper lip broad, double in its entire circuit; jaws whitish, without pointed teeth at the angle. Anterior dorsal spine shortest; fourteen pectoral rays. Uniform brownish-olive; vertical fins darker; caudal white on its posterior edge.

Sandwich Islands.

a. Five inches long. Sandwich Islands.—Type of the species.
b. Young. Feejee Islands. Voyage of the 'Herald.'

28. Pseudoscarus æruginosus.

? Scarus æruginosus, *Cuv. & Val.* xiv. p. 257.
Scarus lacerta, *Cuv. & Val.* xiv. p. 217.
—— æruginosus, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 58.
Pseudoscarus æruginosus, *Bleek. Atl. Ichth.* p. 40. tab. 17. fig. 2.

Two series of scales on the cheek and two scales on the lower præopercular limb; the middle series composed of five or six scales. Upper lip broad, double in its entire circuit; jaws brownish, with or without small, pointed teeth at the angle of the upper jaw. Anterior dorsal spine shortest; fourteen pectoral rays. Uniform greenish-brown, with three silvery bands along the lower side of the belly; caudal without white margin.

East Indian Archipelago.

a. Four and a half inches long.
b. Adult. From Dr. P. v. Bleeker's Collection.

29. Pseudoscarus tricolor.

Scarus tricolor, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 59.
Pseudoscarus tricolor, *Bleek. Atl. Ichth.* p. 39. tab. 17. fig. 1.

Three series of scales on the cheek, the lower of which covers the præopercular limb and is composed of six scales. Upper lip very broad; jaws rosy, without pointed teeth at the angle. Dorsal spines subequal in length; caudal emarginate; fourteen pectoral rays. Upper parts violet, sides blue, lower parts rosy; tail, caudal, and posterior part of the dorsal red; only the dorsal has a blue margin. Nearly uniform brown (in spirits).

Java, Celebes, Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

30. Pseudoscarus rubro-violaceus.

Scarus rubro-violaceus, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 52.
Pseudoscarus rubro-violaceus, *Bleek. Atl. Ichth.* p. 37. tab. 13. fig. 3.

Two series of scales on the cheek and one or two scales on the lower præopercular limb; the inferior series composed of six scales. Upper lip broad, with the inner portion well developed; jaws brownish; teeth of moderate size. Anterior dorsal spines shortest; fifteen pectoral rays; caudal truncated, with the angles produced. Reddish, with numerous irregular, streak-like black spots; fins uniform.

Java.

a. Adult. Moluccas.

31. **Pseudoscarus forsteni.**

Bleeker, Atl. Ichth. p. 38. tab. 8. fig. 2.

Three series of scales on the cheek, the lower of which is composed of five scales and covers the præopercular limb. Upper lip broad; jaws whitish, the upper with pointed teeth at the angle. Dorsal spines subequal in length; fourteen pectoral rays; the upper profile of the head convex. Rose-coloured, with a broad brown band from the eye to the caudal. (*Bl.*)

Celebes.

d. Scales on the cheek in two series.

32. **Pseudoscarus ghobban.**

Scarus ghobban, *Forsk.* p. 28; *Rüpp. Atl. Fische*, p. 78; *Cuv. & Val.* xiv. p. 216.

? Scarus hertit, (*Ehrenb.*) *Cuv. & Val.* xiv. p. 215.

Two series of scales on the cheek, the lower præopercular limb being entirely naked; the lower series composed of six scales. Upper lip broad, with a distinct inner portion; jaws whitish, without conical teeth at the angle; teeth very small. Anterior dorsal spines shortest; fourteen pectoral rays; caudal emarginate. Yellowish, each scale with a blue spot; blue streaks round the eye and a blue band round the lips; another streak from the eye to the angle of the mouth; a red, blue-edged ocellus behind the mandible. Dorsal fin rosy, with a blue line along the base and margin, and with a series of round green spots along the middle; anal blue-edged; caudal rosy, with an oblique short band along each lobe and with an angular band near the base, its posterior margin greenish.

Red Sea.

a. Adult. Red Sea. Presented by Dr. E. Rüppell.

33. **Pseudoscarus collana.**

Scarus collana, *Rüpp. N. W. Fische*, p. 25. taf. 8. fig. 2.
—— collaris, *Cuv. & Val.* xiv. p. 265.

Two series of scales on the cheek, the lower præopercular limb being apparently entirely naked; the lower series composed of five scales. Upper lip broad; jaws white, without pointed teeth at the angle; teeth very small. Dorsal spines subequal in length; caudal slightly emarginate; fourteen pectoral rays. Green: anterior margin of the lower lip, a hammer-like mark on the throat, and a small spot on the interoperculum blue. Dorsal and anal fins red, with the base and the margin blue; a series of round green spots along the middle of the fin. Caudal blue, with red markings, one of which is transverse, the two others oblique.

Red Sea.

a. Adult: stuffed. Red Sea. From Dr. E. Rüppell's Collection.

34. **Pseudoscarus bataviensis.**

Scarus bataviensis, *Bleek. Java*, iv. p. 342.
Pseudoscarus bataviensis, *Bleek. Atl. Ichth.* p. 48. tab. 12. fig. 3.

Two series of scales on the cheek, the lower præopercular limb being entirely naked; the lower series is composed of six scales. Upper lip broad; jaws rosy, the upper with one or two conical teeth at the angle, none at the lower. Dorsal spines subequal in length; fourteen pectoral rays; caudal rounded, with the angles produced. Green: lips red, blue anteriorly and green posteriorly; the green band of the upper lip and the blue of the lower pass behind the angle of the mouth into a green band running to the lower angle of the orbit; two short green streaks behind the orbit. Dorsal fin red, with a blue margin, and with a green band along the middle; anal similarly coloured; caudal rosy, with the upper and lower margins blue, and with three or four slightly curved blue cross-bands. (*Bl.*)

Batavia.

35. **Pseudoscarus schlegelii.**

Bleeker, Atl. Ichth. p. 48. tab. 12. fig. 2.

Two series of scales on the cheek, the lower præopercular limb being entirely naked; the lower series is composed of five scales. Upper lip broad; jaws whitish, the lower with pointed teeth at the angle. Dorsal spines subequal in length; fourteen pectoral rays. Body yellowish superiorly and on the middle, brownish inferiorly and posteriorly; a brown band across the yellowish portion in the middle of the body; a blue spot superiorly in the axil of the pectoral. A greenish band runs from the orbit round the upper lip; two short streaks behind the eye. A green band or series of spots along the middle of the dorsal fin. (*Bl.*)

Celebes.

36. **Pseudoscarus pentazona.**

? Callyodon mutabilis, *Gronov. Syst. ed. Gray*, p. 86.
Pseudoscarus pentazona, *Bleek. Atl. Ichth.* p. 46. tab. 11. fig. 1.

Two series of scales on the cheek, the lower of which is composed of six scales and partly covers the præopercular limb. Upper lip broad; jaws whitish, without pointed teeth at the angle. Dorsal spines equal in length; fourteen pectoral rays. Greenish, with five brownish cross-bands; fins rosy, edged with blue; dorsal with a green band or series of green spots along the middle; a violet spot superiorly in the axil of the pectoral; a bluish streak from the eye round the lips. (*Bl.*)

Celebes.

This species is very closely allied to *Ps. schlegelii.*

37. **Pseudoscarus sumbawensis.**

? Scarus erythrodon, *Cuv. & Val.* xiv. p. 255.
Scarus sumbawensis, *Bleek. Banda*, v. p. 104.
Pseudoscarus sumbawensis, *Bleek. Atl. Ichth.* p. 47. tab. 15. fig. 4.

Two series of scales on the cheek, the lower præopercular limb being entirely naked. Upper lip broad; jaws rosy, with a conical tooth at the angle (in adult state). Dorsal spines subequal in length; fifteen pectoral rays; caudal rounded. Violet-olive, vertical fins darker.

Eastern parts of the East Indian Archipelago. (? Mauritius.)

a. Young. From Dr. P. v. Bleeker's Collection.

38. **Pseudoscarus moensi.**

Scarus moensi, *Bleek. Act. Soc. Sc. Indo-Nederl.* vi. *Celebes*, xiii. p. 54
Pseudoscarus moensi, *Bleek. Atl. Ichth.* p. 47. tab. 12. fig. 1.

Two series of scales on the cheek, the lower series composed of five scales and covering a part of the præopercular limb. Upper lip broad; jaws rosy, the upper with pointed teeth at the angle. Dorsal spines subequal in length; caudal subtruncated; thirteen or fourteen pectoral rays. Greenish: snout reddish; head without bands. Vertical fins rosy, edged with blue; pectorals with a small violet spot superiorly at the base. (*Bl.*)

Celebes.

(*e.* Species insufficiently described, but belonging to division A.)

39. **Pseudoscarus sexvittatus.**

? Callyodon, sp., *Gronov. Zoophyl.* ii. p. 72. tab. 7. fig. 4.
Scarus sexvittatus, *Rüpp. N. W. Fische*, p. 26; *Cuv. & Val.* xiv. p. 267.
? Callyodon lineatus, *Gronov. Syst. ed. Gray*, p. 84.

Caudal truncated; fourteen pectoral rays. Olive, with six broad blackish longitudinal streaks; dorsal and anal edged with blue. Jaws white, without pointed teeth at the angle. (*Rüpp.*)

Djetta (month of June).

40. **Pseudoscarus latus.**

Cearus latus, (*Ehrenb.*) *Cuv. & Val.* xiv. p. 245.

Caudal lobes much produced. Red, each scale with brownish margin; dorsal and anal orange-coloured, caudal red, all edged with violet. (*Val.*)

Red Sea.

41. Pseudoscarus (?) ocellatus.

Scarus ocellatus, *Cuv. & Val.* xiv. p. 278.

Olive: head and tail yellow; a narrow black line crosses the snout before the eye; an oblique black band descends from the neck across the operculum to the thorax; three series of black points behind the pectoral. The spinous dorsal has a black margin and a large ovate black spot; caudal with two large red spots on each lobe; anal uniform yellow. (*Val.*)
Caroline Islands.

Known from a drawing only.

B. Jaws green or blue; upper lip broad, covering at least one-half of the upper jaw.

42. Pseudoscarus guacamaia.

Guacamaia, *Parra*, lam. 26.
Scarus guacamaia, *Cuv. & Val.* xiv. p. 178; *Poey, Mem. Cub.* ii. 1861, p. 421.

Two series of scales on the cheek and a single scale on the lower limb of the præoperculum; caudal rounded, with the lobes much produced in adult specimens. The upper lip covers at least one-half of the jaw. Teeth small. Brownish (in a preserved state), with the jaws and the naked parts of the head green. Fins dark-coloured; margins of the dorsal, anal and ventral fins green.
Atlantic coasts of tropical America.

a. Twenty inches long: skin. Jamaica. From Dr. Parnell's Collection.
b. Half-grown: stuffed. West Indies. Purchased of Mr. Scrivener.
c. Half-grown: not good state. Puerto Cabello. Purchased of Mr. Brandt.
d, e. Adult and half-grown. Bahia. From Dr. O. Wucherer's Collection.

Poey considers the fish described by Valenciennes as different from Parra's species, and calls the former *Scarus pleianus* (*l. c.* p. 393).

43. Pseudoscarus nuchipunctatus.

Scarus nuchipunctatus, *Cuv. & Val.* xiv. p. 224; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 62.
—— limbatus, *Cuv. & Val.* xiv. p. 271; *Bleek. l. c.* p. 60; *Richards. Ichthyol. Chin.* p. 262.
Pseudoscarus nuchipunctatus, *Bleek. Atl. Ichth.* p. 31. tab. 10. fig. 2.

Cheek with three series of scales, the lower of which covers the limb of the præoperculum. Upper lip broad, with the inner portion well developed; jaws green, the upper with a recurved conical tooth at the angle; teeth small. Anterior dorsal spine shortest; fourteen pectoral rays; caudal rounded, with the lobes very slightly produced. Uniform brown; lips with a green cross-band; some oblong spots between the eye and the scapula. Fins black, the vertical fins with a yellow edge.

Indian Ocean and Archipelago.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Sixteen inches long: stuffed. China. Presented by J. R. Reeves, Esq.
c. Half-grown.
d. Adult: skeleton. Amboyna. Purchased of Mr. Frank.

Vertebræ 11/14.

44. **Pseudoscarus janthochir.**

? Scarus prasiognathus, *Cuv. & Val.* xiv. p. 272.
Scarus janthochir, *Bleek. Ternate,* p. 139, and *Act. Soc. Sc. Indo-Nederl.* vi. *Celebes,* xiii. p. 54.
Pseudoscarus janthochir, *Bleek. Atl. Ichth.* p. 30. tab. 5.

Two series of scales on the cheek and two scales on the lower præopercular limb; the middle series composed of seven scales. Upper lip broad; jaws green, with two small pointed teeth at the angle of the upper jaw; teeth small. Anterior dorsal spines shortest; fifteen pectoral rays; caudal crescent-shaped. Greenish, with round green (in spirits, whitish) spots; a red streak from the maxillary to the eye, and a green one from the snout to the eye. Dorsal blue-edged, with green spots on the spinous portion and with violet on the soft. Anal red, edged with blue; caudal green, with a red longitudinal band near the upper margin.

Java, Celebes, Ternate. (? New Ireland.)

a. Adult. Moluccas. Purchased of Mr. Frank.

45. **Pseudoscarus cyanognathus.**

Scarus cyanognathus, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 62.
Pseudoscarus cyanognathus, *Bleek. Atl. Ichth.* p. 32. tab. 11. fig. 2.

Three series of scales on the cheek, the lower of which covers the præopercular limb and is composed of five scales. Upper lip broad; jaws blue, the upper with small pointed teeth at the angle. Dorsal spines subequal in length; caudal with the lobes produced; fourteen pectoral rays. Head much longer than high. Greenish: lips red; a blue band from below the eye round the upper lip; dorsal and anal red, edged with blue; caudal with a broad red crescent, its upper and lower rays being blue.

Java.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

46. **Pseudoscarus octodon.**

Bleeker, Atl. Ichth. p. 33. tab. 13. fig. 2.

Two series of scales on the cheek, the lower series composed of six scales and covering a part of the lower præopercular limb. Upper lip broad; jaws blue, each with a pair of strong pointed teeth at the angle. Fourteen pectoral rays. Body brownish-red; a narrow green streak runs from the eye round the upper lip; upper lip with two green cross-streaks, chin with one. Dorsal and anal edged with blue. (*Bl.*)

Buton.

47. Pseudoscarus singaporensis.

Scarus singapurensis, *Bleek. Singapore*, p. 69.
Pseudoscarus singapurensis, *Bleek. Atl. Ichth.* p. 31. tab. 13. fig. 1.

Two series of scales on the cheek and two scales on the præopercular limb. Upper lip broad; jaws blue, without pointed teeth at the angle of the upper jaw. The dorsal spines increase in length posteriorly; fifteen pectoral rays; caudal with the lobes much produced. Uniform brownish, with numerous irregular whitish spots.

Singapore, Java.

a. Adult. From Dr. P. v. Bleeker's Collection.

C. Jaws green or blue; upper lip narrow, covering less than one-half of the upper jaw.

a. Scales on the cheek in three series, the lower præopercular limb being entirely naked.

48. Pseudoscarus microrhinus.

Scarus microrhinus, *Bleek. Natuurk. Tydschr. Nederl. Ind.* vi. p. 200 & viii. p. 438.
Pseudoscarus microrrhinos, *Bleek. Atl. Ichth.* p. 22. tab. 3.

Three series of scales on the cheek, the lower præopercular limb being naked; the lower and middle series composed of six scales each. Lips very narrow, covering only the base of the jaws; jaws blue, the upper with pointed teeth at the angle. Forehead gibbous in adult specimens. Dorsal spines subequal in length; fifteen or sixteen pectoral rays. Green, rosy beneath: a green band runs from the lower lip to the opercular margin, opposite the upper pectoral rays. Vertical fins rosy, edged with blue; anal with a green band along the middle; caudal immaculate at the base.

Java, Celebes.

a. Adult. From Dr. P. v. Bleeker's Collection.

49. Pseudoscarus strongylocephalus.

Scarus strongylocephalus, *Bleek. Java*, ii. p. 439.
Pseudoscarus strongylocephalus, *Bleek. Atl. Ichth.* p. 23. tab. 4. fig. 3.

Three series of scales on the cheek, the lower præopercular limb being naked. Lips very narrow, covering only a small portion of the jaws; jaws blue, the upper with a pointed tooth at the angle. Forehead convex, not gibbous. Dorsal spines subequal in length; sixteen pectoral rays; caudal with the lobes much produced. Green, each scale rosy at the base, lower parts rosy; upper lip with green cross-bands; a curved green band from the mouth to below the eye, and two bands behind the eye. Vertical fins red; anal and dorsal with blue bands or series of spots along the middle, and with blue base; caudal edged with blue superiorly and inferiorly, and with a crescent-shaped green band on its posterior margin; blue spots on its base. (*Bl.*)

Java.

50. **Pseudoscarus microchilus.**

Scarus capistratus, *Bleek. Batav.* p. 497; (not *K. & v. H.*).
Pseudoscarus microcheilos, *Bleek. Atl. Ichth.* p. 24. tab. 4. fig. 2.

Three series of scales on the cheek, the lower limb of the præoperculum being entirely naked. Lips very narrow, covering only the base of the jaws; jaws blue, without pointed teeth at the angle. Caudal with the lobes slightly produced; sixteen pectoral rays. Brownish-green: head immaculate, lips red; dorsal and anal fins red, edged with blue, and with a round green spot between the single rays and spines; caudal reddish, edged with blue superiorly and inferiorly, and with a green crescent and violet edge posteriorly. (*Bl.*)

Java.

b. Scales on the cheek in three series, the scales of the lower covering the præopercular limb.

51. **Pseudoscarus niger.**

Scarus niger, *Rüpp. N. W. Fische,* p. 24. taf. 8. fig. 1; *Cuv. & Val.* xiv. p. 232.

Three series of scales on the cheek, the lower of which covers the præopercular limb. Upper lip narrow; jaws greenish, with pointed teeth at the angle. Caudal with the lobes produced; fourteen pectoral rays. Head, body, and caudal fin black; lips, and some streaks before, behind and between the orbits reddish; dorsal and anal fins reddish; vertical fins edged with blue. (*Rüpp.*)

Djetta (month of August).

52. **Pseudoscarus xanthopleura.**

Scarus xanthopleura, *Bleek. Batav.* p. 499.
Pseudoscarus xanthopleura, *Bleek. Atl. Ichth.* p. 24. tab. 7. fig. 1.

Three series of scales on the cheek, the lower of which covers the præopercular limb and is composed of two scales. Lips very narrow, covering only the base of the jaws; jaws blue, the upper with pointed teeth at the angle. Caudal with the lobes much produced; fifteen pectoral rays. Upper parts of the head and body green; sides rosy, the lower part of the sides yellow; scales with reddish margins; snout with irregular red streaks. Dorsal red, with broad blue margin and with oblong blue spots at the base between the spines and rays; anal blue, with a rosy longitudinal band; caudal green, edged with yellow posteriorly and with rosy laterally, and with the lobes blue. (*Bl.*)

Java.

c. Scales on the cheek in two series.

53. Pseudoscarus troschelii.

Scarus troschelii, *Bleek. Batav.* p. 498.
Pseudoscarus troschelii, *Bleek. Atl. Ichth.* p. 25. tab. 7. fig. 2.

Two series of scales on the cheek, the lower præopercular limb being naked. Lips very narrow, covering only the base of the jaws; jaws green, the upper with pointed teeth at the angle. Caudal slightly emarginate; fifteen pectoral rays. Green, each scale with reddish margin; lips red; a short red band through the eye, and another from the angle of the mouth, below the eye, towards the operculum; chin with red transverse and longitudinal streaks. Dorsal red, edged with blue, and with a green band along the middle; anal yellowish, with a similar red band; caudal greenish. (*Bl.*)

Java.

54. Pseudoscarus celebicus.

Scarus celebicus, *Bleek. Celebes,* v. p. 253.
Pseudoscarus celebicus, *Bleek. Atl. Ichth.* p. 26. tab. 15. fig. 2.

Two series of scales on the cheek, the lower extending over a part of the præopercular limb. Upper lip very short, covering only the base of the jaw, with the inner portion rudimentary; jaws blue, the upper with one or two conical teeth at the angle. Anterior dorsal spine shortest; fifteen pectoral rays; caudal rounded. Green: lips red, with blue margin; two or three short green streaks behind the eye. Dorsal fin red, with a broad blue margin to its anterior portion, and with a bluish longitudinal band; anal red at the base, and blue on the remainder of the fin; caudal red, blue-edged.

Celebes. Chinese Sea.

a. Fine specimen. Sea of China. Presented by Sir J. Richardson.

55. Pseudoscarus chlorodon.

Scarus chlorodon, *Jenyns, Voy. Beagle, Fishes,* p. 105. pl. 21.
Pseudoscarus chlorodon, *Bleek. Versl. en Meded. Akad. Wetensch. Amsterd. Natuurk.* xii. 1861, *Scar.* p. 5.

Two series of scales on the cheek, the lower præorbital limb being entirely naked. Lips very narrow, covering only the base of the jaws; jaws blue, the upper without pointed teeth at the angle. Fifteen or sixteen pectoral rays. Brown (in a dried state); snout and cheeks much varied with green. A bright green patch in front of the eye, with a pale streak below. Dorsal and anal green, the former with a lighter intramarginal band, the latter with a band along the middle. (*Jen.*)

Kokos Island.

(*d.* Species insufficiently described, but belonging to division C.)

56. Pseudoscarus pectoralis.

Scarus pectoralis, *Cuv. & Val.* xiv. p. 269.

Jaws green, with a small pointed tooth at the angle; caudal lobes produced; neck elevated. Head violet above, yellowish below, both colours separated by a line running from below the eye to the angle of the operculum; lips yellow, with a violet line in the middle; a streak from the chin towards the eye. Anterior two-thirds of the sides violet; back along the dorsal, base of the anal, tail and caudal fin yellow; anal and dorsal violet, with the margin and base yellow. Pectoral with a large violet blotch towards its extremity. (*Val.*)

Djetta.

D. Jaws whitish or rosy; upper lip narrow, covering only one-half, or less, of the upper jaw.

57. Pseudoscarus muricatus.

Scarus muricatus, *Cuv. & Val.* xiv. p. 208. pl. 402; *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr.* p. 46.
Pseudoscarus muricatus, *Bleek. Atl. Ichth.* p. 26. tab. 7. fig. 3.

Three series of scales on the cheek, the lower of which covers the præopercular limb and is composed of four scales. Upper lip very short, covering only the base of the jaw, with the inner portion rudimentary; jaws rosy, with their surface rough or tubercular. Anterior dorsal spines shortest; sixteen pectoral rays; caudal rounded, with the lobes produced. Uniform bluish-grey.

Java.

58. Pseudoscarus caudofasciatus.

Three series of scales on the cheek, the lower of which is composed of three scales and covers the præopercular limb; the middle composed of six scales. Upper lip narrow, covering one-third of the jaw; jaws large, dirty-white, smooth, without pointed teeth at the angle; teeth small. Anterior dorsal spines shortest; caudal truncated, with the lobes produced; fifteen pectoral rays. Lateral line interrupted, with the tubes scarcely branched. Head and trunk uniform brown; tail and vertical fins orange-coloured; tail with three brown cross-bands: the first between the origins of the soft dorsal and anal, the second between their ends; the third, rather indistinct, across the free portion of the tail. Base of the pectoral brown.

Mauritius.

a. Fifteen inches long: stuffed. From Dr. Janvier's Collection.

59. Pseudoscarus rhoduropterus.

Bleeker, Atl. Ichth. p. 27. tab. 4. fig. 1.

Two series of scales on the cheek, the lower series composed of six scales and covering partly the præopercular limb. Lips very narrow; jaws rosy, smooth, the upper with pointed teeth at the angle. Fifteen pectoral rays. Body dark rose-coloured, with four violet cross-bands: the first behind the base of the pectoral, the second to the vent, the third to the middle of the anal, the fourth immediately behind the dorsal and anal fins. (*Bl.*)

Celebes.

60. **Pseudoscarus quoyi.**

Scarus quoyi, pt., *Cuv. & Val.* xiv. p. 273.
Scarus quoyi, *Bleek. Ternate*, ii. p. 607.
Pseudoscarus quoyi, *Bleek. Atl. Ichth.* p. 29. tab. 6. fig. 3.

Two series of scales on the cheek, the lower composed of five scales; the lower præopercular limb entirely naked. Lips narrow, the upper covering only one-half of the jaw; jaws rosy, the upper with pointed teeth at the angle. Caudal slightly emarginate; fifteen pectoral rays. Green: lips blue, edged with red; a large ovate green spot between the angle of the mouth and the posterior margin of the operculum, edged with blue; dorsal fin red, with broad blue margin and with a green band along the middle; anal with a green band along the middle; caudal greenish, with the outer rays blue. (*Bl.*)

New Ireland. Ternate.

61. **Pseudoscarus cyanotænia.**

Scarus cyanotænia, *Bleek. Natuurk. Tydschr. Nederl. Ind.* vi. p. 197.
Pseudoscarus cyanotænia, *Bleek. Atl. Ichth.* p. 28. tab. 6. fig. 1.

Two series of scales on the cheek, the lower series composed of six scales; the lower præopercular limb entirely naked. Lips very short, covering only the base of the jaws; jaws rosy, the upper with a pointed tooth at the angle. Fifteen pectoral rays; caudal rounded, with the outer rays scarcely produced. Red: vertical fins edged with blue; a blue line along the middle of the dorsal; anal without band; a reddish-violet spot superiorly at the base of the pectoral. (*Bl.*)

Java.

62. **Pseudoscarus capistratoides.**

Scarus capistratoides, *Bleek. Verhand. Batav. Genootsch.* xxii. *Labr. Cycl.* p. 50.
Pseudoscarus capistratoides, *Bleek. Atl. Ichth.* p. 29. tab. 6. fig. 2.

Two series of scales on the cheek, the lower composed of six scales; the lower præopercular limb entirely naked. Lips very narrow, covering only the base of the jaws; jaws rosy, the upper with a pointed tooth at the angle. Fifteen pectoral rays. The upper profile of the head convex. Greenish, each scale red at the base; lips red, edged with blue; a bluish band runs from the mouth, below the eye, to the operculum. Vertical fins red, with blue margins and base.

Java.

a. Adult. From Dr. P. v. Bleeker's Collection.

63. **Pseudoscarus gymnognathus.**

Scarus gymnognathos, *Bleek. Batav.* p. 498.
Pseudoscarus gymnognathus, *Bleek. Atl. Ichth.* p. 28. tab. 15. fig. 3.

Two series of scales on the cheek, the lower series composed of six or seven scales and covering a portion of the inferior præopercular

limb. Upper lip very narrow, covering only the base of the jaws; jaws whitish, without pointed teeth at the angle. Dorsal spines subequal in length; caudal subtruncated; fifteen pectoral rays. Brownish; lips red, edged with green. Dorsal red anteriorly, violet posteriorly, with a broad violet margin, like the anal; caudal brownish. (*Bl.*)
Java.

64. **Pseudoscarus gibbus.**

Scarus gibbus, *Rüpp. Atl. Fische*, p. 81. pl. 20. fig. 2; *Cuv. & Val.* xiv. p. 231.

Forehead very convex. Lips narrow; jaws whitish, the upper with pointed teeth at the angle. Dorsal spines subequal in length; sixteen (fifteen) pectoral rays. Dark-violet, two red spots behind the chin; dorsal and anal fins reddish-brown, edged with blue, and with a green stripe along the middle.
Mohila.

Vertebræ 11/13.

Sixth Group. ODACINA.

43. ODAX*.

Odax, sp., *Cuv. & Val.* xiv. p. 298.

Cheeks and opercles scaly; scales of the body small or rather small; lateral line continuous. Snout conical. Dorsal spines rather numerous, flexible. The dentigerous plate of the lower pharyngeal triangular, much broader than long.
Vertebræ 19/17 (*Odax balteatus*).
Coasts of Australia and of New Zealand.

1. **Odax balteatus.**

Odax balteatus, *Cuv. & Val.* xiv. p. 303.
—— algensis, *Richards. Proc. Zool. Soc.* 1840, p. 26, and *Trans. Zool. Soc.* iii. p. 148.

D. $\frac{16-17}{12}$. A. $\frac{3}{12}$. L. lat. 39. L. transv. 4/13. Vert. 19/17.

Præoperculum finely serrated posteriorly. Sides of the head with red and blue streaks; dorsal and anal fins with dark-purple edges and with many very short, slender, oblique bars, regularly crossing the rays. Specimens in spirits show a dark band running from the snout, through the eye, to the curve of the lateral line, where it disappears, or is replaced by a series of indistinct dark blotches.
Van Diemen's Land, Australia. (Kelp-fish.)

a–b. Adult. Port Arthur. From the Haslar Collection.—Types of *O. algensis*.

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* 1. Odax varius, *Cuv. & Val.* xiv. p. 307.—Ulea.

c. Half-grown. Port Jackson. Presented by Sir J. Richardson.
d. Adult: skin. Port Jackson. From Mr. Gould's Collection.
e–f. Fine specimens. Australia. From Mr. Gould's Collection.
g, h. Half-grown: not good state. From the Haslar Collection.

2. Odax frenatus.

D. 31. A. 13. L. lat. 42. L. transv. 3/11.

Præoperculum entire; dorsal nearly even; a dark-brown band from the snout, through the eye, to the end of the operculum; a silvery band below the brown one, and continued on to the tail, where it is gradually lost; a blackish spot anteriorly on the dorsal fin.

Australia.

a–b. Fine specimens. Freemantle. Presented by Dr. Bowerbank.
c. Young. Gages Road, Swan River. Presented by the Earl of Derby.

Description.—Head and body elongate; the height of the latter is one-eighth of the total length, the length of the head is contained four times and a third in it. Snout produced, conical, not twice as long as the eye. Scales on the cheek in two series, the upper of which advances nearly to the angle of the mouth. The gill-membranes are united, and attached to the isthmus. The dorsal spines are flexible, of moderate height, and pass gradually into the soft rays, the posterior of which are branched; caudal fin rather prolonged, one-sixth of the total length; pectoral rounded, a little shorter than the ventral, two-fifths of the length of the head. Back reddish-olive: a straight brown band, which is broader posteriorly, runs from the end of the snout, through the eye, to the posterior portion of the gill-opening; it is accompanied by a silvery band which is continued on the body, passing through the base of the pectoral, and terminating above the anal; a more or less regular series of groups of small brown spots partly along the silvery band, partly without it; pectoral, dorsal and caudal fins red, the latter blackish at the point. A blackish spot between the two first dorsal spines.

Total length 56 lines.

3. Odax semifasciatus.

Cuv. & Val. xiv. p. 299. pl. 407.

D. $\frac{18}{12}$. A. $\frac{2}{11}$. L. lat. 63. L. transv. 15–20.

Præoperculum entire; none of the fin-rays produced; dorsal fin even; caudal rounded. Yellowish, with dark bands across the back. (*Val.*)

Indian Ocean (?).

The specimens mentioned by Sir J. Richardson as *Odax semifasciatus* are of a different species, which we have named after that ichthyologist.

4. Odax richardsonii.

Odax pullus, *Cuv. & Val.* xiv. pl. 408 (not *Forst.*).

D. $\frac{17}{13}$. A. $\frac{3}{11-12}$. L. lat. 60. L. transv. 7/20.

Præoperculum finely serrated posteriorly; none of the fin-rays produced; dorsal fin even; caudal rounded. Brownish or greenish in a preserved state, with rather indistinct dark cross-bands; dorsal fin green.

Coasts of Australia.

a. Adult. Sydney. Presented by Sir J. Richardson.
b. Adult: skin. Port Jackson.
c. Adult: skin. Hobson's Bay.
d–f. Adult: skins. Australia. Purchased of Mr. Warwick.
g. Adult. From the Haslar Collection.

Sir J. Richardson (Ann. & Mag. Nat. Hist. xi. 1843, p. 427) has made the very correct observation, that the figure given by Valenciennes, and named *Odax pullus*, does not agree with Forster's fish from New Zealand.

5. **Odax radiatus.**

Malacanthus radiatus, *Quoy & Gaim. Voy. Astrol. Zool.* iii. p. 719. pl. 19. fig. 2.
Cheilio lineatus, *Cuv. & Val.* xiii. p. 354.
? Odax borbonicus, *Cuv. & Val.* xiv. p. 306.
Odax lineatus, *Richards. Voy. Ereb. & Terr. Fish.* p. 133. pl. 60. figs. 1–5.

D. 30–31. A. 13. L. lat. 44. L. transv. 4/10.

Præoperculum entire; the first dorsal spine slightly produced; caudal with the middle prolonged, rhombic. Back violet, belly orange-coloured, a carmine-red band along the side of the back; a reddish-violet line commences behind the eye, and is forked at the origin of the lateral line, one part running above, the other below the convex portion of the lateral line; a single reddish-violet line runs along and above its straight portion. Sides of the head with blue longitudinal lines; operculum with a dark-green spot. Dorsal fin with greenish, darker-edged longitudinal lines and with a blackish band within its margin; the anterior spine dark; a black band, edged with red superiorly, occupies the anterior third of the base of the fin. Caudal blackish posteriorly; anal yellowish; pectoral rose-coloured; the outer ventral ray produced, with a red, black-edged longitudinal band.

Western coasts of Australia.

a. Adult. Western coast of Australia.
b, *c*. Adult. Freemantle. Presented by Dr. Bowerbank.

6. **Odax vittatus.**

Odax vittatus, (*Soland.*) *Richards. Ann. & Mag. Nat. Hist.* xi. 1843, p. 426.

D. 34. A. 14.

The dorsal fin undulates, varying in its height: its first four rays are equal to each other, after which the fin gradually lowers to the thirteenth or fourteenth spine and then rises again, so that the posterior quarter of the fin is higher than the first rays. Entirely brown, with a silvery band commencing from the lower jaw and running through the base of the pectoral to the lower part of the caudal. Sometimes there are series of small violet spots along the back and sides: old individuals have the silvery band interrupted and composed of spots. (*Rich.*)

New Zealand.

44. CORIDODAX.

Head naked, a few scales behind the orbit; scales of the body small; lateral line continuous. Snout of moderate extent. Dorsal spines numerous, flexible. Pharyngeal apparatus?

New Zealand.

1. Coridodax pullus.

Sparus pullus, *Forst. Descr. Anim. ed. Licht.* p. 306.
Scarus pullus, *Bl. Schn.* p. 288.
Odax pullus, *Cuv. & Val.* xiv. p. 304 (not figure).

D. $\frac{17}{17}$. A. $\frac{3}{11}$. L. lat. 90. L. transv. 10/25.

Three series of small scales behind the orbit; præoperculum entire; caudal sublunulate (?). Uniform blackish-brown.

Queen Charlotte's Sound.

a. Type of the species, fifteen inches long; caudal fin destroyed; pharyngeals taken away. From Forster's Collection.

45. OLISTHEROPS.

Olisthops, *Richards. Ann. & Mag. Nat. Hist.* vii. 1851, p. 290, or *Proc. Zool. Soc.* 1850, p. 74

Head entirely naked; scales of moderate size; lateral line continuous. Snout of moderate extent. Dorsal spines numerous, flexible. Pharyngeal apparatus?

Australia.

1. Olistherops cyanomelas.

Richards. l. c. p. 291, or *Proc. Zool. Soc.* 1850, p. 75. pl. 3. figs. 1 & 2.

D. $\frac{18}{10}$. A. $\frac{3}{10}$. L. lat. 48. L. transv. 7/14.

The height of the body is contained five times and a half in the total length. Blackish-green; a bluish streak along the upper and lower margins of the caudal and along the upper margin of the pectoral. (*Rich.*)

King George's Sound.

46. SIPHONOGNATHUS.

Siphonognathus, *Richards. Proc. Zool. Soc.* 1857, p. 237 *.

Head and body very elongate; snout long, as in *Fistularia*; upper jaw terminating in a long, pointed, skinny appendage; opercles and cheeks scaly; scales of moderate size; lateral line continuous. Dorsal spines numerous, flexible. The dentigerous plate of the lower pharyngeal is very narrow.

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* Mr. Gill, after having first adopted the view of Richardson, and after having referred this genus to the family of "Aulostomatoids," now thinks (Proc. Acad. Nat. Sc. Philad. 1862, p. 233) that it is the type of a peculiar family, remarking at the same time that "I had first perceived its affinities, but that I appear to be wrong

King George's Sound.

1. Siphonognathus argyrophanes.

Richards. l. c. p. 238. pl. 6.

D. $\frac{24}{22}$. A. 14. L. lat. 105. L. transv. 3/12.

A brownish-violet band along the median line of the back; another from the snout, through the eye, to the tip of the caudal fin, which is lanceolate; a silvery band along and below the brown lateral one.

King George's Sound.

a. Fine specimen. Presented by the College of Surgeons.—Type of the species.

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in referring it to the same family with the other Labroids." Neither *Odax* nor *Siphonognathus* appear to be known to Mr. Gill from autopsy, otherwise he certainly would not have endeavoured to separate them into two families, whatever his views of a "family" in Ichthyology may be. *Odax* and *Siphonognathus* are (to give an instance with which Mr. Gill may be more familiar) as closely and naturally allied as *Sus* and *Babirussa*.

Fam. 3. EMBIOTOCIDÆ.

Holconoti seu Embiotocoidæ, *Agass. Am. Journ.* xvi. 1853, p. 383.

Body compressed, elevated or oblong, covered with cycloid scales. Lateral line continuous. One dorsal fin, with a developed spinous portion, and with a scaly sheath along the base, which is separated by a groove from the other scales; anal with three spines and numerous rays. Ventral fins thoracic, with one spine and five soft rays. Teeth in the jaws small, palate smooth. The lower pharyngeal bone triangular, simple. Branchiostegals five or six; gills four, pseudobranchiæ well developed; air-bladder large, simple. Stomach without cæcal appendage, pyloric appendages none. Viviparous.

Vertebræ 17/20 (*Ditrema aggregatum*).

North Pacific.

Synopsis of the Genera.

Dorsal spines 7–11 .... 1. Ditrema, p. 245.
Dorsal spines 16–18 .... 2. Hysterocarpus, p. 251.

1. DITREMA *.

Ditrema, *Schleg. Faun. Japon. Poiss.* p. 77.
Embiotoca, Rhacochilus, Amphistichus, et Holconotus, *Agassiz.*
Holconotus, Micrometrus, Cymatogaster, Pachylabrus, Mytilophagus, et Hyperprosopon, *Gibbons.*
Holconotus, Embiotoca, Damalichthys, Phanerodon, Abeona, Rhacochilus, Amphistichus, et Ennichthys, *Girard.*

Body compressed, elevated, covered with cycloid scales of moderate or rather small size; mouth rather small; teeth conical, in a single series. One dorsal fin, the spinous portion of which is less developed than the soft, and composed of seven to eleven spines; anal with three spines and numerous closely-set rays. Gills four, with a cleft behind; pseudobranchiæ well developed.

West coast of North America; one species from Japan. Entering fresh waters.

1. Ditrema jacksoni.

Embiotoca jacksoni, *Agass. Am. Journ.* xvi. p. 387, xvii. p. 366, and *Proc. Bost. Soc. Nat. Hist.* 1861, p. 126; *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 151; 1855, p. 320, and *U.S. Pacif. R. R. Exped. Fish.* pl. 27, 28, 26. figs. 3 & 4.
Holconotus fuliginosus, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, p. 123.
Embiotoca cassidii, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 151; 1855, p. 320, and *U.S. Pacif. R. R. Exped. Fish.* p. 171. pl. 29 & 26. fig. 12.
—— webbi, *Girard, Proc. Acad. Nat. Sc. Philad.* 1855, p. 320, and *U.S. Pacif. R. R. Exped. Fish.* p. 173. pl. 30.

D. $\frac{9-10}{22-19}$. A. $\frac{3}{26-27}$. L. lat. 60. L. transv. 8/19.

The middle and posterior dorsal spines are of nearly equal length, shorter than the anterior rays. Scales on the cheek in four series. The height of the body is one-half or somewhat less than one-half of the total length (without caudal). Upper jaw a little longer than the lower. The fold of the lower lip is interrupted in the middle. The maxillary extends to, or nearly to, below the anterior margin of the orbit. Caudal fin slightly forked.

a. Adult. San Francisco. From the Boston Museum.
b. Adult: not good state. San Francisco. Presented by the Smithsonian Institution.

2. Ditrema laterale.

Embiotoca lateralis, *Agass. Am. Journ.* 1854, p. 366, and *Proc. Bost. Soc. Nat. Hist.* 1861, p. 126.
Holconotus agassizii, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, p. 121.
Embiotoca lineata, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, pp. 134, 141, 151; 1855, p. 320, and *U.S. Pacif. R. R. Exped. Fish.* p. 174. pl. 31. 26. figs. 5 & 6.

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* 1. Embiotoca argyrosoma, *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 136, and *U.S. Pacif. R. R. Exped.* x. *Fishes*, p. 180.
2. Cymatogaster pulchellus, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, p. 123. —Holconotus pulchellus, *Agass. Proc. Bost. Soc. Nat. Hist.* 1861, p 132.

Embiotoca ornata, *Girard, Proc. Acad. Nat. Sc. Philad.* 1855, p. 321, and *U.S. Pacif. R. R. Exp. Fish.* p. 176. pl. 26. fig. 11.
—— perspicabilis, *Girard, Proc. Acad. Nat. Sc. Philad.* 1855, p. 321, and *U.S. Pacif. R. R. Exp.* vii. p. 178. pl. 26. figs. 1 & 2, xii. pt. 2. p. 357. pl. 32; *Suckley & Cooper, Nat. Hist. Wash. Terr.* p. 357. pl. 32.
Tæniotoca lateralis, *Agass. Proc. Bost. Soc. Nat. Hist.* 1861, p. 133.

D. $\frac{11}{24}$. A. $\frac{3}{30-34}$. L. lat. 60. L. transv. 8/18.

The middle and posterior dorsal spines are of nearly equal length, shorter than the anterior rays. Scales on the cheek in three series. The height of the body is contained twice and a third in the total length (without caudal). Upper jaw a little longer than the lower. The fold of the lower lip is interrupted in the middle. The maxillary does not quite extend to below the anterior margin of the orbit. Anal fin with a yellowish streak along the base.

a. Adult. San Francisco. From the Boston Museum.
b. Adult: not good state. Puget Sound. Presented by the Smithsonian Institution.
c. Adult: skin. Victoria Harbour (Vancouver Islands). Presented by Earl Russell.

3. **Ditrema temminckii.**

Ditrema, *Schleg. Faun. Japon. Poiss.* p. 77. pl. 40. fig. 2.
Ditrema temminckii, *Bleek. Verh. Batav. Genootsch.* xxv. *Japan*, p. 33.
—— læve, *Günth. Acanthopt. Fishes*, ii. p. 392.

D. $\frac{10}{20}$. A. $\frac{3}{27}$. L. lat. 76. L. transv. 10/18.

The dorsal spines become gradually higher posteriorly, the last not being much shorter than the first ray. Scales on the cheek in five series. The height of the body is two-fifths of the total (without caudal). Jaws equal in length anteriorly; the maxillary does not extend to below the front margin of the eye. Lips rather thin, the fold of the lower being interrupted in the middle. The spinous dorsal edged with black.

a. Nine inches long: stuffed. Japan. Purchased of Mr. Frank.
b. Half-grown. From Dr. P. v. Bleeker's Collection.

The discovery that this species is naturally allied to the *Embiotocidæ* of the North American ichthyologists is due to Mr. Gill, who communicated it to me in 1861. I had erroneously placed it among the *Nomeina*, from which it differs externally in having one continuous dorsal fin.

4. **Ditrema vacca.**

Damalichthys vacca, *Girard, Proc. Acad. Nat. Sc. Philad.* 1855, p. 321, and *U.S. Pacif. R. R. Exp.* x. *Fishes*, p. 182, xii. pl. 33; *Suckley & Cooper, Nat. Hist. Wash. Terr.* p. 358. pl. 33.

D. $\frac{10}{22}$. A. $\frac{3}{33}$. L. lat. 61. L. transv. 7/16.

The dorsal spines become gradually higher posteriorly, the last being much shorter than the first ray. Scales on the cheek in four series. The height of the body is two-fifths of the total length (without caudal). Upper jaw longer than the lower; the maxillary does not extend to the vertical from the front margin of the eye. Lips rather thick, the fold of the lower being interrupted in the middle. Caudal deeply forked.

a. Adult. San Francisco. From the Boston Museum.

5. Ditrema toxotes.

Rhacochilus toxotes, *Agass. Am. Journ.* 1854, p. 367, and *Proc. Bost. Soc. Nat. Hist.* 1861, p. 130; *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 136, and *U.S. Pacif. R.R. Exp.* x. *Fishes,* p. 188. pl. 40.

Pachylabrus variegatus, *Gibbons, Proc. Ac. Nat. Sc. Philad.* 1854, p. 126.

D. $\frac{11}{23}$. A. $\frac{3}{29}$. L. lat. 73. L. transv. 11/21.

The dorsal spines slightly increase in length posteriorly, but are considerably lower than the anterior rays. Scales on the cheek in six or seven series. The height of the body is contained twice and two-fifths in the total length (without caudal). Jaws subequal anteriorly; lips thick, the fold of the lower continuous round the jaw.

a. Adult. San Francisco. From the Boston Museum.

6. Ditrema furcatum.

Phanerodon furcatus, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 153; 1855, p. 322, and *U.S. Pacif. R.R. Exp.* x. *Fishes,* p. 184. pl. 34. figs. 1–5.

D. $\frac{10-11}{24}$. A. $\frac{3}{32}$. L. lat. 63. L. transv. 5/14.

The dorsal spines increase in length posteriorly, the last being not much shorter than the first ray Scales on the cheek in three series. The height of the body is two-fifths of the total length (without caudal). Jaws equal in length anteriorly; the fold of the lower lip is interrupted in the middle.

a. Adult. San Francisco. From the Boston Museum.

7. Ditrema caryi.

Embiotoca caryi, *Agass. Am. Journ.* xvi. 1853, p. 389; xvii. 1854, p. 366.

Holconotus gibbonsi, *Calif. Acad. Nat. Sc. in Proc. Acad. Nat. Sc. Philad.* 1854, p. 121.

Hypsurus caryi, *Agass. Proc. Bost. Soc. Nat. Hist.* 1861, p. 133.

D. $\frac{9-10}{21-24}$. A. $\frac{3}{24}$. L. lat. 71. L. transv. 7/18.

The middle dorsal spines are a little longer than the posterior, and shorter than the anterior rays. Scales on the cheek in three series. The height of the body is two-fifths of the total length (without caudal). Upper jaw a little longer than the lower. Lips rather thick, the fold of the lower being interrupted in the middle. The maxillary does not extend to the vertical from the front margin of the orbit.

a. Adult. San Francisco. From the Boston Museum.

8. **Ditrema aggregatum**

Micrometrus aggregatus, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, p. 125; *Agass. Proc. Bost. Soc. Nat. Hist.* 1861, p. 128.
Cymatogaster aggregatus, *Gibbons, l. c.* p. 106.
Holconotus rhodoterus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, pp. 141, 152; 1855, p. 322; *U.S. Pacif. R. R. Exp.* x. *Fishes*, p. 193. pls. 35, 36. figs. 1–4 *, pl. 26. figs. 7 & 8; *Suckley, Nat. Hist. Wash. Terr.* p. 358; (not *Agass.*).
Metrogaster aggregatus, *Agass. l. c.* p. 133.

D. $\frac{9-10}{19-21}$. A. $\frac{3}{22-24}$. L. lat. 40–44. L. transv. 4/12. Vert. 17/20.

The middle dorsal spines are longer than the posterior. Scales on the cheek in three series. The height of the body is two-fifths of the total length (without caudal). Jaws equal in length anteriorly; lips thin, the fold of the lower being continuous round the jaw. The maxillary does not quite extend to the anterior margin of the eye.

a. Adult. San Francisco. From the Boston Museum.
b–c. Half-grown. Humboldt's Bay. Presented by the Smithsonian Institution.
d. Fine specimen. New Orcas Islands. Presented by the Lords of the Admiralty.
e–h. Males and pregnant females. From the Haslar Collection.
i–l. Adult: skins. Esquimault Harbour, Vancouver Islands. Presented by Earl Russell.
m. Adult: skeleton. Humboldt's Bay. Presented by the Smithsonian Institution.

9. **Ditrema brevipinne.**

D. $\frac{7}{15}$. A. $\frac{3}{23}$. L. lat. 45. L. transv. 4/12.

The three posterior dorsal spines are the longest, a little shorter than the anterior rays. Scales on the cheek in two series. The height of the body is one-third of the total length (without caudal). Jaws equal in length anteriorly; lips thin, the fold of the lower being interrupted in the middle. The maxillary does not quite extend to the anterior margin of the eye.

Vancouver Islands.

a. Seven and a half inches long: skin. Esquimault Harbour. Presented by Earl Russell.

We would add to the above diagnosis: Head somewhat longer than high, its length being nearly one-fourth of the total (without caudal). The upper profile is somewhat concave above the eye. The diameter of the orbit equals the extent of the snout, and is two-sevenths of the length of the head. Cleft of the mouth oblique; teeth rather small, in a single series. The scaly part of the cheek is narrower than the orbit. The dorsal fin commences vertically above the root of the ventrals: the first spine is very short; the three following increase in length, the three last being the longest, of nearly equal length, half as long as the head; the anterior rays a little longer than the last spines. The anal fin commences below the seventh dorsal ray, and extends further backwards than the dorsal fin, its spines being very distinct; caudal fin emarginate.

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* If the figure of pl. 36 has really been drawn from a specimen of this species, the control over the artist must have been very careless, the scales being represented much too small.

Back dark-greenish-olive, belly silvery.

10. **Ditrema minimum.**

Micrometrus minimus, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, p. 125; *Agass. Proc. Bost. Soc. Nat. Hist.* 1861, p. 129.
Cymatogaster minimus, *Gibbons, l. c.* p. 106.
Holconotus trowbridgii, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 152.
Abeona trowbridgii, *Girard, l. c.* 1855, p. 322, and *U. S. Pacif. R. R. Exp.* x. *Fish.* p. 186. pl. 34. figs. 6–10.

D. $\frac{9-10}{14}$. A. $\frac{3}{15-16}$. L. lat. 42. L. transv. 4/13.

The middle dorsal rays are longer than the posterior. Scales on the cheek in three series. The height of the body is contained twice and a third in the total length (without caudal). Jaws equal in length anteriorly; lips thin, the fold of the lower being continuous round the jaw.

a. Four and a half inches long. San Francisco. From the Boston Museum.

11. **Ditrema arcuatum.**

Hyperprosopon arcuatus, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, p. 125; *Agass. Proc. Bost. Soc. Nat. Hist.* 1861, p. 133.
—— argenteum, var., *Gibbons, l. c.* 1854, p. 106.

D. $\frac{9}{27-28}$. A. $\frac{3}{33}$. L. lat. 74. L. transv. 8/20–21.

Eye very large, longer than the snout, its length being one-third of that of the head. The profile of the occipital region is concave. The middle dorsal spines are longer than the posterior and than the soft rays. Scales on the cheek in four series. The height of the body is contained twice and a fourth in the total length (without caudal). The lower jaw longer than the upper; the maxillary extends slightly beyond the vertical from the anterior margin of the eye. The cleft of the mouth does not extend upwards to the horizontal from the upper margin of the pupil. Lips thin; the fold of the lower continuous round the jaw. Ventral black posteriorly.

a. Adult. San Francisco. From the Boston Museum, as *Hyperprosopon argenteum.*

12. **Ditrema megalops.**

Hyperprosopon argenteum, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, pp. 105, 125; *Agass. Proc. Bost. Soc. Nat. Hist.* 1861, p. 132.
Holconotus megalops, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 152.

Enniehthys megalops, *Girard, l. c.* 1855, p. 323, and *U. S. Pacif. R. R. Exp.* x. *Fish.* p. 197. pl. 37, pl. 26. fig. 10.

D. $\frac{9}{27}$. A. $\frac{3}{36\,(32)}$. L. lat. 85.

Forehead much depressed. The height, taken from the upper axil of the pectoral, equals the distance of the chin from the lower axil of the pectoral. The middle dorsal spines are longer than the posterior. Lower jaw longer than the upper; the cleft of the mouth extends upwards to, or even beyond, the horizontal from the upper margin of the pupil. Lips thin; the fold of the lower continuous round the jaw. Ventral black posteriorly.

Coasts of California.

We are indebted to Mr. Gill for the principal characters contained in the above diagnosis.

13. Ditrema agassizii.

Hyperprosopon agassizii, *Gill, in litt.*

D. $\frac{9}{27}$. A. $\frac{3}{33}$. L. lat. 65. L. transv. 8/20.

Eye large, longer than the snout, its length being somewhat less than one-third of that of the head. Occipital region scarcely concave. The middle dorsal spines are longer than the posterior and than the soft rays. Scales on the cheek in four series. The height of the body is contained twice and a seventh in the total length (without caudal). The lower jaw rather longer than the upper; the maxillary extends to the vertical from the anterior margin of the eye. Lips thin; the fold of the lower continuous round the jaw. Caudal fin black posteriorly; ventral uniform whitish.

a. Fine specimen. San Francisco. From the Boston Museum, as *Hyperprosopon argenteum.*

14. Ditrema anale.

Hyperprosopon analis, *Agass.*
Hypocritichthys analis, *Gill, in litt.*

D. $\frac{8}{22}$. A. $\frac{3}{23}$. L. lat. 65. L. transv. 6/10.

Eye a little longer than the snout, its length being nearly one-fifth of that of the head. The middle dorsal spines are longer than the posterior. The height of the body is one-third of the total length (with the caudal); lower jaw rather longer than the upper; the fold of the lower lip is continuous round the jaw. Top of the spinous dorsal black; a black spot in the middle of the caudal. (*Gill.*)

California.

15. Ditrema rhodoterum.

Holconotus rhodoterus, *Agass. Am. Journ.* 1854, p. 368, and *Proc. Bost. Soc. Nat. Hist.* 1861, p. 132.

Cymatogaster larkinsii, *Gibbons, Proc. Ac. Nat. Sc. Philad.* 1854, p. 123.

? Cymatogaster ellipticus, *Gibbons, l. c.* p. 124.

Amphistichus heermanni, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 135.
Ennichthys heermanni, *Girard, l. c.* 1855, p. 323, and *U. S. Pacif. R. R. Exp.* x. *Fish.* p. 199. pl. 38, pl. 26. fig. 9.

D. $\frac{9}{26}$. A. $\frac{3}{28-31}$. L. lat. 70. L. transv. 8/23.

The middle dorsal spines are longer than the posterior and than the soft dorsal. Scales on the cheek in five series, rather irregularly disposed. The height of the body is contained twice and a fifth in the total length (without caudal). Jaws nearly equal anteriorly; the maxillary extends nearly to below the middle of the eye. Lips rather thin; the fold of the lower continuous round the jaw.

a. Adult. San Francisco. From the Boston Museum.

16. Ditrema argenteum.

Amphistichus argenteus, *Agass. Am. Journ.* 1854, p. 367, and *Proc. Bost. Soc. Nat. Hist.* 1861, p. 131; *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, pp. 141, 153; 1855, p. 323; and *U.S. Pacif. R R. Exp.* x. *Fishes,* p. 201. pl. 39.
Mytilophagus fasciatus, *Gibbons, Proc. Ac. Nat. Sc. Philad.* 1854, p. 125.
Amphistichus similis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 135; 1855, p. 323; and *U.S. Pacif. R. R. Exp.* x. *Fishes,* p. 203. pl. 36. figs. 5–9.

D. $\frac{9-11}{24}$. A. $\frac{3}{24-29}$. L. lat. 65. L. transv. 8/22.

The middle dorsal spines are either nearly as long as, or somewhat longer than, the posterior. Scales on the cheek in five series, somewhat irregularly disposed. The height of the body is contained twice and a fourth in the total length (without caudal). Jaws equal anteriorly; the maxillary extends to below the centre of the orbit. Lips thin; the fold of the lower interrupted in the middle.

a. Adult. San Francisco. From the Boston Museum.

2. HYSTEROCARPUS.

Hysterocarpus, *Gibbons, Proc. Acad. Nat. Sc. Philad.* 1854, p. 124.

Body compressed, oblong, covered with scales of moderate size; mouth rather small; teeth conical, in a single series. One dorsal fin, with sixteen to eighteen spines. Anal with three spines and numerous rays. Intestinal tract short, with two circumvolutions.

Coast of California, entering fresh waters.

1. Hysterocarpus traskii.

Gibbons, Proc. Acad. Nat. Sc. Philad. 1854, pp. 105, 124, *Girard, ibid.* 1856, p. 136, and *U.S. Pacif. R. R. Exp.* x. *Fishes,* p. 190. pl. 26. fig. 14 (embr.).

D. $\frac{16-18}{10-11}$. A. $\frac{3}{21-22}$. L. lat. L. transv. $\frac{6-7}{13-14}$.

The middle dorsal spines are longer than the posterior. Scales on the cheek in three series. The height of the body is one-third of the total length (with the caudal). Jaws subequal anteriorly; lips rather thin, the fold of the lower continuous round the jaw.

California.

Fam. 4. GERRIDÆ

Body compressed, elevated or oblong, covered with sparoid scales. Lateral line continuous. Dorsal fin with the spinous and soft portions equally developed, and with a scaly sheath along the base, which is separated by a groove from the other scales. Anal with three (two) spines and with the soft portion similar to the soft dorsal. Ventral fins thoracic, with one spine and five soft rays. Teeth small, palate toothless. The lower pharyngeal bones are firmly united by a suture. Branchiostegals six; gills four, pseudobranchiæ present, glandular; air-bladder present. Stomach without cæcal sac; pyloric appendages rudimentary. Oviparous. Vertebræ 10/14.

Tropical seas.

Since Kner's discovery of the Pharyngognathian nature of the genus *Gerres*, it has become necessary to remove it from the family *Pristipomatidæ*, to which we formerly referred it, and place it among the Acanthopterous Pharyngognaths, if such a suborder is retained in the system. It must here form a separate family; and its position near the *Embiotocidæ* appears to be by no means an unnatural one, both having the scaly sheath along the base of the dorsal.

The family contains one genus only, of which an account has been given in the first volume; but having since received specimens of several species, the diagnoses of most of them have been revised.

1. GERRES*.

Gerres, *Cuv. Règne Anim.*; *Cuv. & Val.* vi. p. 446.
Catochænum, *Cant. Catal.* p. 55.
Gerres, Diapterus, et Synistius, *Gill, Proc. Acad. Nat. Sc. Philad.* 1862, p. 238.

Form of the body compressed, oblong or elevated. Mouth very protractile, and descending when thrust out. Eye rather large. Præoperculum generally entire. Six branchiostegals. No canine teeth. Formula of the fins: Dorsal $\frac{9}{10-11}$. Anal $\frac{3}{7\,(-9)}$. Caudal forked. Scales moderate, minutely or not ciliated. Air-bladder simple; pyloric appendages in small number. Pseudobranchiæ.

All the tropical seas, entering fresh waters. One species from the coast of North America.

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* 1. Gerres bilobus, *Cuv. & Val.* vi. p. 466.—Cape Verde.
2. —— peruvianus, *Cuv. & Val.* vi. p. 467; *Less. Voy. Coqu. Zool. Poiss.* p. 180.—Coast of Peru.
3. —— richii, *Cuv. & Val.* vi. p. 469.—East Indies?
4. Smaris lineatus, *Humboldt, Observ. Zool.* p. 185. pl. 46. f. 1; *Agass. in Spix, Pisc. Brasil.* p. 115. pl. 67.—Gerres lineatus, *Cuv. & Val.* vi. p. 470. —Acapulco.
5. —— lucidus, *Cuv. & Val.* vi. p. 477.—Pondicherry.
6. —— waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 292.—Waigiou.

1. Gerres longirostris.

Gerres longirostris, *Rapp*; *Günth. Proc. Zool. Soc.* 1861, p. 142. pl. 24.

D. $\frac{9}{11}$. A. $\frac{3}{8}$.

The last dorsal spines are rather longer than the first rays. The height of the body is one-half of the total length (without caudal). Præorbital and præoperculum not serrated. The spines are moderately strong; the length of the second of the dorsal being four-sevenths of that of the head and two-fifths of the depth of the body. The second and third anal spines are considerably shorter than those of the dorsal fin, the second being rather the stronger. Silvery, with darker stripes along the series of scales.

Cape of Good Hope.

2. Gerres plumieri.

Cuv. & Val. vi. p. 452. pl. 167.

D. $\frac{9}{10}$. A. $\frac{3}{7-8}$. L. lat. 37. L. transv. 6/11. Vert. 10/14.

The height of the body is twice and one-fifth in the total length (without caudal fin). Præorbital serrated. The second dorsal and anal spines exceedingly strong and long, the former slightly the longer, nearly as long as the head. Silvery, with more or less distinct longitudinal stripes, corresponding to the series of scales; dorsal generally blackish.

Atlantic coasts of tropical America.

Eight specimens, from St. Domingo, Guatemala, Pernambuco, and Bahia.

Skeleton: see vol. i. p. 340.

3. Gerres patao.

Poey, Mem. Cub. ii. p. 192.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 35.

The height of the body is contained twice and four-fifths in the total length, the length of the head four times; the diameter of the eye is contained thrice and two-thirds in the latter. Præorbital and præoperculum finely serrated. The second dorsal spine is strong, one-third of the height of the body, equal in length to the second and third anal spines, the former being stronger than the latter and than the dorsal spine. Silvery-white, with bluish lines along the series of scales. Fins pale-blackish, pectorals yellowish. (*Poey.*)

Cuba.

4. Gerres rhombeus.

Sloane, Jamaica, ii. pl. 253. fig. 1.
Gerres brasilianus, *Cuv. & Val.* vi. p. 458.
—— rhombeus, *Cuv. & Val.* vi. p. 459.

D. $\frac{9}{10}$. A. $\frac{2-3}{9-8}$. L. lat. 38. L. transv. 6/11. Vert. 9/15.

The height of the body is one-half of the total length (without caudal fin). Præorbital entire; præoperculum distinctly, interoperculum finely serrated. The spines moderate: the second of the dorsal two-thirds of the length of the head, in young individuals as long as the head; the second of the anal three-fourths of the second of the dorsal. Silvery; dorsal with a blackish margin.

Atlantic coasts of tropical America.

Sixteen specimens, from Cuba, Jamaica, and Puerto Cabello.

Skeleton: see vol. i. p. 342.

5. Gerres zebra.

Müll. & Trosch. in Schomburgk's Barbad. p. 668.

D. $\frac{9}{10}$. A. $\frac{3}{7}$.

Silvery; steel-blue above; five or seven vertical bands. The height of the body is one-third of its length, and contains twice and a half the length of the second and third dorsal spines, and thrice that of the second anal spine. (*M. & T.*)

Coast and freshwater ponds of Barbadoes.

6. Gerres nigri.

Günth. Fishes, i. p. 347.

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 42. L. transv. 5/11.

The height of the body is twice and three-fifths in the total length (without caudal fin); the diameter of the eye is about one-third of the length of the head, rather longer than the snout, and equal to the distance between the eyes. The groove for the processes of the intermaxillary bones is elongate, triangular, reaching nearly to the vertical from the centre of the eye, and is entirely scaleless. Spines of the fins rather slender; the second of the dorsal is twice and a fifth in the height of the body, and nearly twice as long as the third of the anal, which is rather longer, but less stout, than the preceding. Silvery, with indistinct longitudinal stripes above the lateral line; the vertical fins blackish; dorsal black-edged.

Mouth of the River Niger.

a. Adult. River Niger. From Mr. Fraser's Collection.
b. Half-grown. Coast of Africa. From the Haslar Collection.

7. Gerres squamipinnis.

Günth. Fishes, i. p. 349.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 43–44. L. transv. 5/13.

The height of the body is twice and a half in the total length (without caudal fin); the diameter of the eye is thrice and three-fifths in the length of the head, rather shorter than the snout, but equal to the distance between the eyes. The groove for the processes of the intermaxillary bones is broad, triangular, entirely scaleless, and does not reach to the vertical from the centre of the eye. The dorsal spines are rather slender and slightly compressed; the second is once and three-fifths in the length of the head. The second anal spine is rather strong, stronger and a little longer than the third; its length is once and two-fifths in that of the head. Caudal fin deeply forked, entirely covered with scales; the length of a lobe is nearly three and a half in the total. Uniform silvery; the margin of the dorsal fin blackish.

Caribbean Sea.

a–d, e. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.

f. Adult: not good state. Guatemala. Purchased of Mr. Frank.

8. Gerres gula.

Cuv. & Val. vi. p. 464; *Jenyns, Zool. Beagle, Fishes,* p. 58.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 4/9. Vert. 9/15.

The height of the body is twice and three-fourths in the total length (without caudal fin). Præorbital and præoperculum entire, the latter with the angle slightly rounded. The groove for the processes of the intermaxillaries extends nearly to the vertical from the centre of the eye; a transverse stripe of scales covers a part of the groove, separating from it the posterior third *. The snout is shorter than the diameter of the eye, and equal to the space between the eyes. The spines of the fins of moderate strength; the second and third of the dorsal half as long as the head, but twice as long as the second of the anal. Silvery: dorsal fin minutely dotted with brown; the dots more crowded at the top of the dorsal.

Atlantic coasts of tropical America.

Eleven specimens, from St. Domingo, Jamaica, and Bahia.
Skeleton: see vol. i. p. 347.

9. Gerres aprion.

Cuv. & Val. vi. p. 461.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 6/10. Cæc. pylor. 3.

The height of the body is one-third of the total length (without caudal fin). Præorbital and præoperculum entire, the latter with the angle slightly rounded. The groove for the processes of the intermaxillaries extends to the vertical from the centre of the eye, is elongate, and entirely free of scales. The snout is slightly longer than the diameter of the eye, which exceeds the width of the head between the eyes. The spines of the fins moderate; the second of the dorsal is longer than one-half of the length of the head, and nearly twice as long as the second of the anal. Silvery: a deep-black spot at the top of the dorsal fin; the upper part of the snout blackish-brown.

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* Space between the eyes with a fovea in the middle (*Jenyns, l. c.*).

Atlantic coasts of tropical America.

Nineteen specimens, from St. Domingo, Jamaica, and Bahia.

10. Gerres argenteus.

Eucinostomus argenteus, *Baird & Girard in Ninth Smithson. Rep.* 1854, p. 335*, and in *Mex. Bound. Surv.* p. 17. pl. 9. figs. 9–12.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 47. L. transv. 5/10.

The height of the body is nearly one-third of the total length (without caudal). Præorbital and præoperculum entire; the groove for the processes of the intermaxillaries extends nearly to the vertical from the centre of the eye, is elongate, and entirely free of scales. The snout is rather longer than the eye, the diameter of which is two-sevenths of the length of the head, and rather more than the width of the interorbital space. The spines of the fins are of moderate length and strength: the third of the dorsal is rather longer than the second, and more than half as long as the head; the second of the anal fin is stronger but rather shorter than the third, its length being nearly three-fourths of that of the third dorsal spine. Shining greenish, with a broad silvery band along the middle of the side; a deep-black spot at the top of the dorsal fin.

Atlantic coasts of North America.

a–c. From 2–2½ inches long. Presented by the Smithsonian Institution as *Eucinostomus argenteus*.

The first description was drawn up by Messrs. Baird and Girard from specimens from the New Jersey coast, the second by the same authors from specimens from the coast of Texas; the figure, again, does not agree with the accompanying description; therefore it is not improbable that those learned naturalists have confounded two species. The specimens mentioned above have the black dorsal spot, and appear to belong to the Collection sent to the Smithsonian Institution from Texas.

11. Gerres poeti.

Cuv. & Val. vi. p. 468; *Bleek. Verh. Bat. Gen.* xxiii. *Mænid.* p. 11.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 35. L. transv. 5/10.

The height of the body is two-fifths of the total length (without caudal); the diameter of the eye is one-third of the length of the head. The groove for the processes of the intermaxillaries extends beyond the vertical from the front margin of the eye, is irregularly ovate, and entirely free of scales. Snout shorter than the eye, the diameter of which equals the width of the interorbital space. Spines of the fins very strong and broad: the third dorsal spine is rather longer than the second, its length being contained twice and a quarter in the depth of the body and once and two-thirds in the length of the head; its width is one-tenth of its length. The second anal spine is nearly equal in length to the third, and two-fifths of the depth of the body; its width is one-fifth or one-sixth of its length. Uniform silvery; dorsal fin with a blackish upper margin.

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* Misprinted 345.

East Indies.

a. Five and one-third inches long. From Dr. P. v. Bleeker's Collection.

12. Gerres subfasciatus.

Cuv. & Val. vi. p. 477.

D. $\frac{9}{10}$. A. $\frac{3}{7}$.

The height of the body is one-third of the total length; the snout is rather shorter than the diameter of the eye. Spines of the fins slender: the third of the dorsal fin is one-half of the height of the body, its width being less than one-twelfth of its length; the second anal spine stronger but rather shorter than the third, and about one-fifth of the height of the body. Silvery, with six or seven indistinct vertical bands.

Port Jackson.

a–b, c–e. Adult and half-grown: bad state. From the Haslar Collection.

13. Gerres ovatus.

Günth. Fishes, i. p. 343.

D. $\frac{9}{10-11}$. A. $\frac{3}{7}$. L. lat. 36. L. transv. 5/10.

The height of the body is twice and a quarter in the total length (without caudal fin); the diameter of the eye is one-third of the length of the head, longer than the snout, and equal to the distance between the eyes. The groove for the processes of the intermaxillary bones is short, and does not extend beyond the vertical from the anterior margin of the eye; there are no scales between that groove and the orbit. The spines of the dorsal slender and flexible: the second and third longest, and twice and a half in the height of the body; the last four dorsal spines half as long as the third. The third of the anal fin longest, shorter than the first ray, and nearly one-fourth of the height of the body. Coloration uniform; dorsal black-edged.

Coast of Australia.

a, b. Adult. Australia.

14. Gerres abbreviatus.

Bleeker, Java, i. p. 103, and *Verh. Batav. Genootsch.* xxiii. *Mænid.* p. 11.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 33. L. transv. 5/10.

The height of the body is contained twice and two-thirds in the total length; the diameter of the eye is one-third of the length of the head. Præorbital and præoperculum entire. The second spine of the dorsal fin more than one-half of the height of the body, and nearly equal to the length of the head. The second and third anal spines strong, and rather longer than the rays, one-third of the height of the body. Coloration uniform; dorsal black-edged.

East Indian Archipelago.

a. Adult. Amboyna. Purchased of Mr. Frank.

15. **Gerres altispinis.**

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 38. L. transv. 5/10.

The height of the body is contained twice and a fifth in the total length (without caudal), the length of the head thrice and a third. The diameter of the eye is one-third of the length of the head, equal to the width of the interorbital space, and more than the extent of the snout. The groove for the processes of the intermaxillaries is rounded behind, naked, and extends beyond the vertical from the anterior margin of the eye. The free portion of the tail is higher than long. There are three and a half longitudinal series of scales between the highest point of the lateral line and the scaly sheath of the dorsal fin, which is composed of broad scales. Dorsal spines of moderate strength: the third is rather higher than the second, its length being contained twice and a fourth in the height of the body and once and three-fifths in the length of the head. The posterior dorsal spines are rather high, although shorter than the first rays; the last spine is a little longer than the eighth, and three-quarters as long as the third. The scaly sheath of the anal rather low; the second anal spine is stronger but shorter than the third, which is half as long as the head. Caudal forked, its length being one-fourth of the total, and equal to that of the pectoral, which does not extend to the anal fin. Silvery.

Ganges.

a. Forty lines long. Presented by G. R. Waterhouse, Esq.

16. **Gerres philippinus.**

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 48. L. transv. 6/12.

The height of the body is contained twice and two-fifths in the total length (without caudal), the length of the head twice and a fourth; the length of the caudal is two-ninths of the total. The diameter of the eye is one-third of the length of the head, equal to the width of the interorbital space, and more than the extent of the snout. The groove for the processes of the intermaxillaries is rounded behind, naked, and extends beyond the vertical from the anterior margin of the eye. The free portion of the tail is longer than high. The scaly sheath of the dorsal fin is very high. The second dorsal spine elongate, its length being two-thirds of the height of the body.

The second anal spine is much stronger but scarcely shorter than the third, and not quite half as long as the head; the scaly sheath covers the posterior anal rays entirely. Pectoral very long, extending to the second anal spine. Silvery; each dorsal ray and the posterior spines with a blackish dot near the base.

Philippine Islands.

a. Three and a half inches long.

17. Gerres kapas.

Bleeker, Riouw, p. 482.

D. $\frac{9}{10}$. A. $\frac{3}{7\,(6)}$. L. lat. 40. L. transv. 4/9.

The height of the body is two-fifths of the total length (without caudal); the diameter of the eye is one-third of the length of the head, equal to the width of the interorbital space, and more than the extent of the snout. The groove for the processes of the intermaxillaries does not extend beyond the vertical from the front margin of the eye and is not scaly. The free portion of the tail is scarcely longer than high. There are only three longitudinal series of scales between the uppermost part of the lateral line and the scaly sheath of the spinous dorsal. Dorsal spines slender, half as high as the body and two-thirds as long as the head. The second anal spine is strong, shorter than the third, its length being contained thrice and a third in the height of the body and twice and two-fifths in the length of the head. The length of the caudal lobes is two-ninths of the total. Silvery; the spinous dorsal with a black margin; each dorsal ray with a blackish dot in the middle.

East Indian Archipelago.

a. Four and three-quarter inches long. From Dr. P. v. Bleeker's Collection.

18. Gerres limbatus.

Gerres limbatus, *Cuv. & Val.* vi. p. 476.
Catochænum limbatum, *Cant. Catal.* p. 55.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 37. L. transv. 5/10.

The height of the body is two-fifths of the total length (without caudal fin). Præorbital and præoperculum entire. The snout is rather longer than the eye, the diameter of which equals the width of the interorbital space and is two-sevenths of the length of the head. The groove for the processes of the intermaxillaries is entirely scaleless, and extends beyond the front margin of the eye. The second dorsal spine is considerably longer than the third, its length in adult specimens being more than one-half of the height of the body; in half-grown specimens it is scarcely longer than the third, and half as high as the body. The scaly sheath of the dorsal fin is moderately developed. The second anal spine is stronger and a little longer than the third, its length being more than one-half of the length of the second dorsal spine. There are four series of scales between the highest point of the lateral line and the dorsal fin. Silvery; caudal with a broadish, blackish margin; the spinous dorsal with a narrow black edge.

Coast of Coromandel; Pinang.

a–b. Seven inches and three and a half inches long: skins. Pinang. From Dr. Cantor's Collection.

19. Gerres punctatus.

Cuv. & Val. vi. p. 480.

$$D. \frac{9}{10}. \quad A. \frac{3}{8}.$$

The height of the body is contained thrice and a half in the total length. The second dorsal spine prolonged into a short filament, and sometimes as long as three-quarters of the height of the body. Silvery; dorsal with a narrow black margin, each ray with a brown point at the base. Young individuals with indistinct cross-bands.

Coast of Pondicherry; Sea of China.

? *a*. Adult: bad state. Old Collection; named *Sparus edentulus*.

20. Gerres japonicus.

Bleeker, Japan, p. 404, and *Verh. Bat. Gen.* xxvi. *Japan*, p. 93. tab. 5. fig. 2.

$$D. \frac{9}{10}. \quad A. \frac{3}{7}. \quad \text{L. lat. 40.} \quad \text{L. transv. 5/10.}$$

The height of the body is contained twice and two-thirds in the total length (without caudal); the diameter of the eye is one-third or a little less than one-third of the length of the head. Snout rather shorter than the eye, the diameter of which equals the width of the interorbital space in half-grown specimens and is rather less in adult ones. The groove for the processes of the intermaxillaries is short, ovate, obtusely rounded behind, and extends scarcely beyond the vertical from the front margin of the eye. Præorbital and præoperculum entire. The free portion of the tail is considerably longer than high. Dorsal spines rather slender: the second scarcely longer than the third, one-half of the height of the body and two-thirds of the length of the head. Anal spines rather stout: the second is shorter than the third, and nearly one-fourth of the height of the body; the caudal lobes are contained four times and two-thirds or four times and three-quarters in the total length. Dorsal blackish superiorly; each ray and the posterior spines with a blackish dot near the base.

Japanese and Chinese Seas.

a–i. Adult. Amoy.

k. Adult. From Dr. P. v. Bleeker's Collection.

l, *m–n*. Half-grown and young: not good state. China. Presented by J. R. Reeves, Esq.

21. Gerres filamentosus.

Russell, i. p. 52. pl. 68.
Gerres filamentosus, *Cuv. & Val.* vi. p. 482; *Bleek. Verh. Batav. Genootsch.* xxiii. *Mænid.* p. 11.
—— punctatus, *Bleeker, Topogr. Batav.* (not *Cuv.*).
Catochænum filamentosum, *Cant. Catal.* p. 56.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 6/12.

The height of the body is twice and one-third in the total length (without caudal fin). The spines of moderate strength; the second of the dorsal fin produced into a filament, which sometimes extends to the caudal. The scaly sheath of the dorsal fin is high. The second anal spine is stronger and shorter than the third, one-third of the length of the head.

Coasts of the East Indies and of North Australia.

a, b. Adult: not good state. Molucca Sea. Purchased of Mr. Frank.
c. Adult: stuffed. Cape York (in 68 fathoms.) Voyage of the 'Rattlesnake.'
d–e. Adult and half-grown: skins. Pinang. From Dr. Cantor's Collection.

22. Gerres macracanthus.

Bleeker, Natuurk. Tydschr. Nederl. Ind. 1854, vi. p. 195.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 43. L. transv. 5/11.

The height of the body is contained twice and two-thirds in the total length (without caudal). The diameter of the eye is a little less than one-third of the length of the head, and nearly equal to the extent of the snout and to the width of the interorbital space. The groove for the processes of the intermaxillaries is pointed posteriorly, naked, and extends beyond the vertical from the anterior margin of the eye. The free portion of the tail is nearly as high as long. The scaly sheath of the dorsal fin is low. The second dorsal spine very long, sometimes extending to the caudal. The second anal spine is stronger and shorter than the third, one-third of the length of the head. Silvery; each dorsal ray and the posterior spines with a blackish dot near the base.

Java, Nias, Banka.

a. Five inches long. From Dr. P. v. Bleeker's Collection.

23. Gerres oyena.

Labrus oyena, *Forsk.* p. 35; *Bl. Schn.* p. 245; *Lacép.* iii. p. 463.
Sparus erythrurus, *Bl.* tab. 261 (very bad).
Cichla erythrura, *Bl. Schn.* p. 336.
Sparus britannus, *Lacép.* iv. pp. 132, 134.
Labrus longirostris, *Lacép.* iii. p. 467. pl. 19. fig. 1.
Smaris oyena, *Rüpp. Atl.* p. 11. taf. 3. fig. 2.
Gerres oyena, *Cuv. & Val.* vi. p. 472; ? *Jenyns, Zool. Beagle, Fishes*, p. 59; *Bleek. Verhand. Batav. Genootsch.* xxiii. *Mænid.* p. 12.
—— oblongus, *Bleek. Topogr. Batav.* (not *Cuv.*).

? Gerres equula, *Temm. & Schleg. Faun. Japon. Poiss.* p. 76. pl. 40. fig. 1 (not good); *Bleek. Verhand. Batav. Genootsch.* xxvi. p. 92.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 35–38. Cæc. pylor. 3. Vert. 10/14.

The height of the body is contained twice and three-fourths in the total length (without caudal fin). Præorbital and præoperculum entire, the latter with the angle slightly rounded. The snout is a little longer than the diameter of the eye, which is one-third of the length of the head. The spines of the fins of moderate length and strength; the second of the dorsal is one-half of the height of the body, and at least twice as long as the second anal spine. Uniform silvery.

Red Sea; Indian Ocean and Archipelago.

Four specimens—one from Amboyna.

24. Gerres acinaces.

Bleeker, Nat. Tydschr. Nederl. Ind. 1854, vi. p. 194.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45. L. transv. 6/11.

The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head thrice and one-fourth; the diameter of the eye is one-fourth of the length of the head, and less than the extent of the snout, which equals the width of the interorbital space. The groove for the processes of the intermaxillary bones extends beyond the front margin of the eye, and is entirely naked. The spines of the fins are rather slender: the second dorsal spine is longer than the third, its length being more than one-half of the height of the body, and two-thirds of the length of the head; the second of the anal fin is not so strong as the second of the dorsal, scarcely longer than the third of the anal, two-sevenths of the height of the body and two-fifths of the length of the head. Caudal with scarcely any scales, very deeply forked, the length of its lobes being contained twice and two-thirds in the total.

Seas of Java and Kokos.

a. Fine specimen, 8½ inches long. From Dr. P. v. Bleeker's Collection.

25. Gerres gigas.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 46. L. transv. 6/11.

The height of the body equals the length of the head and is two-sevenths of the total (without caudal). The diameter of the eye is two-sevenths of the length of the head, and less than the length of the snout, which equals the width of the interorbital space. The groove for the processes of the intermaxillary bones is pointed behind, not scaly, and extends beyond the front margin of the eye. The free portion of the tail is considerably longer than high. The second dorsal spine is elongate, sabre-shaped, its length being contained once and a fourth in that of the head. Anal spines slender: the second longer and stronger than the third, its length being contained twice and three-fourths in that of the head; the scaly sheath of both fins moderately developed. Caudal lobes produced, their length being four times and a third in the total. The pectoral extends beyond the vent, and is one-fourth of the total length. Silvery; dorsal with a blackish margin.

Tonga Islands.

a. Twelve inches long. From the Haslar Collection.

26. **Gerres argyreus.**

Sciæna argyrea, *Forster*.
Cichla argyrea, *Bl. Schn.* p. 344.
Gerres waigiensis, *Quoy & Gaim. Voy. Freyc. Zool.* p. 292.
—— argyreus, *Cuv. & Val.* vi. p. 478.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 45.

The height of the body is scarcely more than the length of the head, and one-third of the total (without caudal fin); the diameter of the eye is one-third of the length of the head, and rather longer than the snout, the extent of which equals the distance between the eyes. The groove for the processes of the intermaxillary bones is entirely scaleless, and does not extend to the vertical from the centre of the eye. The spines of the fins are slender; the second of the dorsal is one-half of the height of the body, and more than twice the length of the second anal spine, which is rather stronger, but not longer, than the third. Silvery; top of the dorsal blackish.

Red Sea; Waigiou, Strong, Tanna; Port Jackson.

a, b. Adult. From the Haslar Collection.
c–d. Adult: not good state: skins. Port Jackson. Purchased of J. Gould, Esq.

27. **Gerres macrosoma.**

Bleeker, Gilolo, p. 56.

D. $\frac{9}{10}$. A. $\frac{3}{7}$. L. lat. 42. L. transv. 5/10.

The height of the body is four times in the total length (one-third, without caudal), the length of the head four and two-thirds to four and three-fifths; the diameter of the eye is a little less than one-third, or one-third, of the latter, and equal to the length of the snout and to the width of the interorbital space. The groove for the processes of the intermaxillary bones is entirely scaleless, and does not extend to the vertical from the centre of the eye. The spines of the fins are slender: the second of the dorsal is contained once and three-quarters in the height of the body; the second of the anal shorter than the third. Silvery: each spine and ray of the dorsal with a brown basal spot; the spinous portion black-edged.

East Indian Archipelago.

a. Half-grown. Amboyna. Purchased of Mr. Frank.
b. Adult. From Dr. P. v. Bleeker's Collection.

28. Gerres oblongus.

Cuv. & Val. vi. p. 479.

D. $\frac{9}{10}$. A. $\frac{3}{7}$.

The height of the body is less than one-fourth of the total length. Spines of the fins slender. Silvery, with five or six indistinct brownish vertical bands. Lateral line nearly straight. (*Cuv.*)

Sea of Ceylon.

Fam. 5. CHROMIDES.

Chromides, *Müll. Berl. Abhandl.* 1844, p. 169; *Owen, Lect. Comp. Anat.* ii. p. 48.

Body elevated, oblong or elongate, scaly, the scales generally being ctenoid. Lateral line interrupted or subinterrupted. One dorsal fin, with a developed spinous portion; three or more anal spines; the soft anal similar to the soft dorsal. Ventral fins thoracic, with one spine and five soft rays. Teeth in the jaws small; palate smooth. The lower pharyngeal bone triangular, with a median suture. Branchiostegals five or six; gills four; pseudobranchiæ none; air-bladder present. Pyloric appendages none (or in small number); stomach with a cæcal appendage. The abdominal and caudal vertebræ are nearly equal in number, or the number of the former is slightly increased.

Freshwater fishes from the tropical parts of Africa and America; one genus from Western India. The species with lobate teeth and with many circumvolutions of the intestines are herbivorous, the others carnivorous.

Synopsis of the Genera.

A. The spinous and soft portions of the dorsal fin are of equal extent, or the former is the more developed.

I. The anterior prominences of the outer branchial arch are short, or lanceolate and widely set; no additional lobe.

a. Teeth lobate and anal spines numerous.

Body elevated .... 1. Etroplus, p. 265.

b. Teeth lobate; anal spines 3.

Operculum scaly.............................. 2. Chromis, p. 267.

Operculum scaleless .... 3. Sarotherodon, p. 273.

c. Teeth conical; scales cycloid.

Anal spines 3 .... 4. Hemichromis, p. 274.

d. Teeth conical, forming a narrow band; body ovate, more or less elevated, covered with ctenoid scales; anterior prominences of the outer branchial arch short.

Anal spines 3–4; the soft dorsal naked or slightly scaly at the base; jaws equal anteriorly or the lower prominent...... 5. Acara, p. 276.

Anal spines 3–4; the soft dorsal naked; the upper jaw overlapping the lower... 6. Theraps, p. 284.

Anal spines 5 or more; cleft of the mouth rather narrow; scales of moderate size; the origin of the ventral falls vertically behind that of the dorsal .... 7. Heros, p. 285.

Anal spines 8–9; scales of moderate size; the origin of the ventral falls vertically before that of the dorsal .... 8. Mesonauta, p. 300.

Anal spines 5; cleft of the mouth wide... 9. Petenia, p. 301.

Anal spines 8; scales small .... 10. Uaru, p. 302.

Anal spines 3; dorsal fin enveloped in small scales .... 11. Hygrogonus, p. 303.

e. Teeth villiform, in a broad band; habit Perch-like; anterior prominences of the outer branchial arch lanceolate, crenulated, widely set.

Anal spines 3; vertical fins scaly......... 12. Cichla, p. 303.

f. Teeth villiform or conical; body depressed, elongate, subcylindrical; anterior prominences of the outer branchial arch short.

Anal spines 3; vertical fins scaleless...... 13. Crenicichla, p. 305.

II. The anterior prominences of the outer branchial arch are long, setiform, closely set.

Anal spines 3 .... 14. Chætobranchus, p. 309.

III. The outer branchial arch is provided with a compressed lamelliform lobe at its upper extremity.

Eye in, or in advance of, the middle of the length of the head .... 15. Mesops, p. 311.

Eye behind the middle of the length of the head; dorsal fin scaleless .... 16. Satanoperca p. 312.

Eye behind the middle of the length of the head; base of the soft dorsal scaly. 17. Geophagus, p. 315.

B. The soft portion of the dorsal fin is more developed than the spinous.

I. Branchial arches with the anterior prominences very obsolete.

Anal spines 8–10 .... 18. Symphysodon, p. 315.

II. Anterior prominences of the outer branchial arch setiform.

Anal spines 6 .... 19. Pterophyllum, p. 316.

1. ETROPLUS.

Etroplus, *Cuv. & Val.* v. p. 486.
Etroplus et Pseudetroplus, *Bleeker.*

Body compressed, elevated, covered with ctenoid scales of moderate size. Dorsal and anal spines numerous. Teeth compressed, lobate, in one or two series. Anterior prominences of the branchial arches not numerous, short, conical, hard. Dorsal fin not scaly.

Western parts of India.

1. Etroplus suratensis.

Chætodon suratensis, *Bl.* taf. 217; *Lacép.* iv. p. 461.
Etroplus meleagris, *Cuv. & Val.* v. p. 486.

D. $\frac{18-19}{14-16}$. A. $\frac{12}{11-12}$. L. lat. 40. L. transv. 23. Vert. 17/14.

Greenish, each scale with a pearl-coloured dot. Body with five more or less indistinct dark vertical bands; root of the pectoral blackish.

Coasts of Malabar and Coromandel. Ceylon.

a. Adult: skin. Ceylon. From Dr. Kelaart's Collection.
b, c, d. Adult and half-grown. Ceylon.
e. Half-grown. From the Collection of the Zoological Society.

According to a communication from Dr. v. Bleeker, he intends to separate this species generically from *E. maculatus*, retaining the name of *Etroplus* for the former, and adopting that of *Pseudetroplus* for the latter. He writes, that the characters of the new genus are, tricuspid teeth, and a scaly sheath along the base of the dorsal and anal fins. I find these characters *equally* developed in *E. suratensis* and in *E. maculatus*, and I can come to no other conclusion than that Dr. v. Bleeker either has a third species, different from both, or that he has taken the characters for *Etroplus* from a very old specimen of *E. suratensis* in which the incisions in the front teeth have become obsolete.

2. Etroplus maculatus.

Chætodon maculatus, *Bl.* taf. 427. fig. 2 (not descr.).
—— maculatus, *Bl. Schn.* p. 228.
—— kakaitsel, *Lacép.* iv. p. 543.
Etroplus maculatus, *Cuv. & Val.* v. p. 489.
—— coruchi, *Cuv. & Val.* v. p. 491. pl. 136.

D. $\frac{18}{8}$. A. $\frac{12(-13)}{9}$. L. lat. 40. L. transv. 22. Cæc. pylor. 3. Vert. 15/13.

Greenish, each scale with a silvery margin; a round black spot on the side.

Coast of Malabar.

a–b. Adult. From the Collection of the Zoological Society.
c. Adult: skeleton. From the Collection of the Zoological Society.

The caudal portion of the vertebral column is scarcely longer than the abdominal. The first hæmal spine and the anterior interhæmals form together a subsemicircular arch enclosing the posterior portion of the abdominal cavity.

2. CHROMIS *.

Chromis, pt., *Cuv. Règne Anim.*
Acara, pt., *Heck. Brasil. Fluss-Fische in Ann. Wien. Mus.* ii. 1840, p. 338.
Tilapia, *Smith, Ill. Zool. S. Afr. Pisces.*
Haligenes, *Günth. Proc. Zool. Soc.* 1859, p. 471.

Body compressed, oblong, covered with scales of moderate size; opercles scaly. Dorsal spines numerous, anal spines three. Teeth compressed, more or less lobate, in one series, behind which are other series containing immature teeth. Anterior prominences of the branchial arches short, thin, lamelliform, non-serrated. Dorsal fin not scaly. Intestines with numerous circumvolutions.

Fresh or brackish waters of Africa.

1. Chromis niloticus.

Bulti, Bolty.
Labrus niloticus, *Hasselqu.* p. 392; *L. Mus. Ad. Fried.* ii. p. 79, and *Syst. Nat.* i. p. 477; *Bl. Schn.* p. 252; *Lacép.* iii. p. 487.
Sonnini, p. 396. tab. 27. fig. 1.
Labrus melanogaster, *Bl.* taf. 296; *Bl. Schn.* p. 246.
Chromis niloticus, *Cuv. Règne Anim.*

D. $\frac{15-18}{12-14}$. A. $\frac{3}{9-11}$. L. lat. 33. L. transv. $\frac{5}{13}$. Vert. $\frac{17-18}{15-14}$.

Teeth very small, in several series. Scales below the eye in two series; sometimes a rudimentary third series below the præorbital. Snout obtusely conical, with the upper profile oblique. Caudal subtruncated; the soft dorsal extends to, or nearly to, the middle of the caudal, if laid backwards. The height of the body is contained twice and one-third in the total length (without caudal).

Nile.

a–e. Fine specimens. Lower Nile. From Consul Petherick's Collection.
f. Half-grown. Nile. From Dr. E. Rüppell's Collection.
g. Fine specimen. Chartoum. From Consul Petherick's Collection.
h. Half-grown: stuffed.
i. Large specimen: skeleton. Nile. From Dr. E. Rüppell's Collection.
k. Adult female: skeleton. Lower Nile. From Consul Petherick's Collection.

Description.—The height of the body is contained twice and a third in the total length (without caudal), the length of the head thrice and a half. The upper profile of the head is slightly concave, descending obliquely downwards. Snout much longer than the eye; cleft of the mouth slightly oblique, broad, broader than long. Teeth very small, in four series; there are thirty-five on each side of the front series in the upper jaw. Interorbital space twice as broad as the orbit, slightly convex. The naked portion of the præoperculum is as high as long, and at the angle as wide as the scaly part below the eye.

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* 1. Tilapia rangii, *Dumér. Ann. Mus.* x. p. 255.—Gorea.
2. —— affinis, *Dumér. l. c.*—Senegal.
3. —— macrocentra, *Dumér. l. c.*—Senegal.
4. Labrus quindecim-aculeatus, *Lacép.* iii. p. 432. pl. 25. fig. 1.—*Hab.* ——?

The dorsal spines vary considerably in number and in length; they are always very strong, broader on one side than on the other; the seventh and eighth rays form the highest part of the soft dorsal, and extend sometimes to the middle of the caudal. Anal and ventral spines very strong. Pectoral composed of fourteen rays, the fourth and fifth of which extend to the anal; the ventral extends to the vent. Scales cycloid, higher than long; one of the largest covers three-fourths of the orbit.

The lower pharyngeals are united by a suture, triangular, and armed with very small villiform teeth.

Greenish-olive, shining silvery, each scale with darker centre; a dark spot on the operculum; the soft portions of the vertical fins with whitish spots, surrounded by oblique or transverse blackish streaks.

This species attains to a length of sixteen inches.

Skeleton.—The bones of this species are very solid and firmly joined together. The jaw-bones are short; the processes of the intermaxillaries are received into a very broad groove, not extending backwards to the front margin of the orbit. The upper surface of the skull is very broad, provided with strong longitudinal crests, of which that of the occipital is the highest. Base of the skull with a pair of flat and rather small condyles for the articulation of the upper pharyngeals. Vertebral column composed of eighteen abdominal and fourteen caudal vertebræ, the former portion being considerably the longer. The third vertebra has a very broad and strong process, extending downwards into the abdominal cavity.

2. Chromis mossambicus.

Chromis mossambicus, *Peters, Berl. Monatsber.* 1852, p. 681.
—— niloticus, *Peters, Wiegm. Arch.* 1855, p. 267; *Müller, Monatsber. Berl. Acad.* 1844, p. 32.

D. $\frac{15\text{–}16}{12\text{–}11}$. A. $\frac{3}{10}$. L. lat. 30. L. transv. 4/12.

Teeth small, in several series; thirty-five on each side of the front series in the upper jaw. Scales below the eye in three series, the upper extending to below the posterior margin of the orbit. Snout obtusely conical, with the upper profile oblique. Caudal subtruncated; the soft dorsal extends to, or nearly to, the middle of the caudal, if laid backwards. Greenish-olive, shining golden, each scale with darker centre; vertical fins blackish, with more or less distinct whitish spots. Young specimens with an ovate black spot behind the base of the last dorsal spine.

Fresh waters of Mozambique.

a–k. Zambeze. From Prof. Peters's Collection.
l, m. Mauritius: stuffed. From Sir A. Smith's Collection.

Although this species is closely allied to *Ch. niloticus*, we cannot agree with Prof. Peters, who considers both as identical: there are three very distinct series of scales on the cheek, and one series less above the lateral line; the teeth are equal in number in both species, but conspicuously larger in that from the coast of Mozambique; the cleft of the mouth is wider.

3. Chromis sparrmanni.

Tilapia sparrmanni, *Smith, Ill. Zool. S. Afr. Pisc.* pl. 5 (not good).

D. $\frac{13-14}{11}$. A. $\frac{3}{9-10}$. L. lat. 28. L. transv. $\frac{4}{10}$.

Teeth small, in several series; scales below the eye in two series; snout very obtuse and short; caudal subtruncated; the soft dorsal extends nearly to the middle of the caudal, if laid backwards. An ovate black spot at the base of the anterior soft dorsal rays.

Freshwater streams to the north of Orange River.

a–b. Five inches long: stuffed. From Sir A. Smith's Collection.—Types of the species.

c, d. Fine specimens. From Sir A. Smith's Collection.

Description.—This species is very different from *Ch. niloticus* and *Ch. mossambicus*, with which it has been confounded, and may be readily distinguished by its larger teeth and low cheeks. The height of the body is contained twice and a half in the total length (without caudal), the length of the head thrice and a third. The upper profile of the head is slightly convex. Snout obtuse, short, not longer than the eye; cleft of the mouth as long as broad. Teeth small, in three series; there are twenty-two on each side of the front series of the upper jaw. Interorbital space as broad as the orbit, rather flat. The naked portion of the præoperculum is higher than long, and at the angle narrower than the scaly part below the eye.

The first ventral ray is produced into a filament, which sometimes extends to the middle of the anal.

Greenish-olive, shining silvery, with indistinct darker transverse bands; a dark spot on the operculum; the soft portions of the vertical fins with transverse series of dark spots; an ovate black spot on the base of the last spine and of the three first rays of the dorsal fin.

4. Chromis tristrami.

Haligenes tristrami, *Günth. Proc. Zool. Soc.* 1859, p. 471. pl. 9. fig. B.

D. $\frac{14\,(-17)}{12}$. A. $\frac{3}{9}$. L. lat. 28. L. transv. 3/11.

Teeth rather small, twenty-three on each side of the outer series of the upper jaw; scales below the eye in three series; snout obtuse and rather elevated; the height of the body is two-fifths of the total length (without caudal); the lower profile scarcely curved; the soft dorsal extends to, or beyond, the middle of the caudal, if laid backwards. Greenish, with seven or eight dark vertical bars; a dark spot on the operculum; an ovate black spot behind the last dorsal spine.

Salt Lake and ditches of Tuggurt (Eastern Sahara). Ashantee.

a–b. Tuggurt. Presented by the Rev. H. B. Tristram.—Types of the species.
c. Ashantee.

I have nothing to add to the detailed description given in the 'Proceedings of the Zoological Society,' except that I have found a third specimen in the Collection of the British Museum, said to be from Ashantee. This specimen is eight inches long, and has seventeen dorsal spines; the caudal fin is more deeply emarginate, and the soft dorsal and anal are much prolonged, the former nearly extending to the end of the caudal, whilst the outer ventral ray reaches to the middle of the anal.

The genus *Haligenes* was separated from *Chromis* on account of the indistinctness of the inner series of teeth. It is evident from the large specimen, however, that the interior teeth form rather a band than a series, differing from that in *Chromis* only by its being more remote from the front series.

5. Chromis polycentra.

Tilapia polycentra, *Dumér. Ann. Mus.* x. p. 254.

$$D. \frac{18}{8}. \quad A. \frac{3}{7}.$$

Scales below the eye in three series; the height of the body is two-fifths of the total length (without caudal); the width of the interorbital space equals the diameter of the eye *. Scales minutely dotted with black; the soft portion of the dorsal with light dots, and with a black spot at the base. (*Dum.*)

Gorea.

6. Chromis nigripinnis.

Tilapia nigripinnis, *Guich. in Ann. Mus.* x. p. 254. pl. 22. fig. 2.

$$D. \frac{16}{10}. \quad A. \frac{3}{9}.$$

Scales on the cheek in two series; the height of the body is two-fifths of the total length (without caudal). Uniform brownish; fins blackish, immaculate. (*Dum.*)

Gaboon.

7. Chromis heudelotii.

Tilapia heudelotii, *Dumér. Ann. Mus.* x. p. 254.

$$D. \frac{14}{10}. \quad A. \frac{3}{7}.$$

Scales on the cheek in three series; the height of the body is a little less than one-half of the total length (without caudal). Brownish; the soft dorsal with oblique series of dark spots. (*Dum.*)

Senegal.

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* In a specimen $0^{m}\cdot086$ long (without caudal).

8. Chromis latus.

D. $\frac{16}{12}$. A. $\frac{3}{9}$. L. lat. 28. L. transv. $\frac{3\frac{1}{2}}{11}$.

Teeth rather small, nineteen on each side of the outer series of the upper jaw; scales below the eye in three series; snout obtuse and rather elevated; the height of the body is contained twice and a quarter in the total length (without caudal); the lower profile nearly as much curved as that of the back; the soft dorsal does not extend to the middle of the caudal. Uniform brownish-olive, each scale shining golden in the centre; upper part of the opercular membrane black; a round black spot behind the base of the last dorsal spine.

West Africa.

a. Four inches and a half long. West Africa. From Mr. Fraser's Collection.

Description.—Body compressed, rather elevated, its greatest depth being contained only twice and a quarter in the total length (without caudal); the upper profile of the head is straight, and descends in as oblique a line as in *Ch. tristrami.* The length of the head is contained thrice and a quarter in the total (without caudal). The snout is rather short and elevated, somewhat longer than the diameter of the eye, which is less in width than the interorbital space. The vertical limb of the præoperculum is considerably longer than the horizontal; both are naked, and on the widest part narrower than the scaly portion of the cheek. Interoperculum subvertical as in *Ch. tristrami.*

Caudal slightly emarginate. The outer ventral ray prolonged into a filament, which extends to the vent, or as far backwards as the pectoral.

9. Chromis guineensis.

Haligenes guineensis, *Bleek. in litt.*

D. $\frac{15}{12}$. A. $\frac{3}{9}$. L. lat. 30. L. transv. 3/?.

The height of the body is contained thrice and a quarter or thrice and three-fifths in the total length (with the caudal), the length of the head four times and a third or four times and two-fifths. The maxillary extends to below the anterior part of the eye. Teeth broad. Scales below the eye in four series. Operculum with a blackish spot behind; dorsal and caudal fins with stripes and with ocelli. (*Bl.*)

Ashantee.

10. Chromis pleuromelas.

Tilapia pleuromelas, *Dumér. Ann. Mus.* x. p. 253.

D. $\frac{14}{14}$. A. $\frac{3}{10}$.

Scales below the eye in two series. The height of the body is scarcely more than one-half of the total length (without caudal). Brownish; a large black blotch on each side. (*Dum.*)

Senegal.

11. Chromis lateralis.

Tilapia lateralis, *Dumér. Ann. Mus.* x. p. 253.

D. $\frac{14}{12}$. A. $\frac{3}{10}$.

Scales below the eye in two series. The height of the body is more than one-half of the total length (without caudal). Brownish, with a blackish lateral blotch extending over three-quarters of the length of the body. (*Dum.*)

Senegal.

12. Chromis melanopleura.

Tilapia melanopleura, *Dumér. Ann. Mus.* x. p. 252. pl. 22. fig. 1.

D. $\frac{15}{12}$. A. $\frac{3}{9}$.

Scales below the eye apparently in six series. Brownish; sides of the trunk blackish. (*Dum.*)

Senegal.

13. Chromis microcephalus.

Melanogenes microcephalus, *Bleek. in litt.*

B. 5. D. $\frac{15}{11-12}$. A. $\frac{3}{9}$. L. lat. 26. L. transv. 3/11.

Teeth very slender, flexible, in several series; scales below the eye in two series; snout obtusely conical, much longer than the eye; caudal slightly emarginate; the soft dorsal extends to, or nearly to, the middle of the caudal. A dark spot on the operculum. The length of the head is contained thrice and three-fourths in the total (with the caudal).

a–b. Seven inches long. Western Africa. From the Haslar Collection.

Description.—The height of the body is one-half of the total length (without caudal), the length of the head is contained twice and two-thirds in it. The upper profile of the snout is slightly convex, descending obliquely downwards. Snout much longer than the eye, slightly elevated; cleft of the mouth somewhat oblique, as long as broad, with the lower jaw slightly projecting beyond the upper. Teeth very small and slender, flexible, in five or six series, those of the outer series being the longest, forty-five on each side of the upper jaw; only a very few of them show a notch at the brown apex. Interorbital space broader than the orbit, convex. The naked portion of the præoperculum is higher than long, and as wide at the angle as the scaly part below the eye.

The pectoral is composed of fourteen rays, and the third and fourth are so much prolonged as to extend to the origin of the soft anal. Ventral pointed, not reaching to the vent.

Scales cycloid, large, higher than long; one of the largest covers the orbit.

Greenish, shining golden; a dark spot on the operculum; the soft dorsal with indistinct whitish spots.

14. Chromis macrocephalus.

Melanogenes macrocephalus, *Bleek. in litt.*

D. $\frac{15}{10-11}$. A. $\frac{3}{8}$. L. lat. 28. L. transv. 3/?.

Teeth very slender, flexible, in several series; scales below the eye in two series. The height of the body is contained thrice and a half in the total length (with the caudal), the length of the head thrice and a quarter or thrice and two-fifths; snout obtuse, elevated. Greenish: lower parts of the head deep-black; a black spot on the neck and in the suprascapulary region. (*Bl.*)

Ashantee.

15. Chromis (?) galilæus.

Sparus galilæus, (*Art.*) *Hasselqu. Iter Palæst.* p. 389.

B. 5. D. $\frac{17}{14}$. A. $\frac{3}{12}$.

"Caput valde declive. Rostrum breve. Maxilla superior longior. Pinnæ pectorales acuminatæ, radiis xi (?), medii longissimi; pinnæ ventrales, radiis vii (?). Cauda æqualis. Dorsum et abdomen infra anum acuminata. Caput, dorsum et pinna ani viridia; latera abdominis argentea: abdomen albidum; pinnæ albidæ. Squamæ amplæ, læves, deciduæ."

Lake Genezareth. Ten inches long and four broad.

3. SAROTHERODON.

Sarotherodon, *Rüpp. Verzeichn. Mus. Senckenb. Fische*, p. 21.
Coptodon, *Gervais, Bull. Soc. cent. Agricult. de l'Hérault*, 1853, p. 80.

Body compressed, oblong, covered with scales of moderate size; opercles scaleless. Dorsal spines numerous, anal spines three. Teeth compressed at the apex, in a single series, with a band of villiform teeth behind. Lateral line interrupted. Branchiostegals five.

Gold Coast, Guinea.

We do not admit this genus into the system without serious doubts as to its validity. The scales on the operculum are deciduous in all the species of *Chromis*, and sometimes every trace of scales and of the cutis is lost on one side, whilst they are present on the other. The typical specimens have five branchiostegals, and not seven as stated by Rüppell.

1. Sarotherodon melanotheron.

Rüppell, l. c.

My friend Dr. D. Weinland has examined the typical specimens at my request, and it is evident from his remarks that this species is closely allied to *Chromis microcephalus*: there are the same proportions of the head, the same numbers of dorsal and anal spines, and of scales. The form of the teeth appears to be exactly the same as in that species, but they are less in number, viz. about sixty-six in the upper jaw and forty-four in the lower. The lower jaw is black.

Gold Coast.

We refer, for the present, the following species to this genus, on account of the alleged absence of scales on the opercles.

2. Sarotherodon (?) zillii.

Acerina zillii, *Gervais, Acad. Sc. et Lettres Montpellier*, 1848, and *Ann. Sc. Nat.* 3 sér. x. p. 303.
Coptodon zillii, *Gervais, Bull. Soc. cent. Agricult. de l'Hérault*, 1853, p. 80. pl. 4. figs. 5–7.
Glyphisodon zillii, *Valenc. Comptes Rend.* xlvi. 1858, p. 713.

D. $\frac{15}{10}$. A. $\frac{3}{8}$. L. lat. 24.

Five or six branchiostegals. Forty teeth in the upper jaw, thirty-six in the lower. Scales on the cheek in three or four series. The height of the body is more than the length of the head, and one-third of the total. Dorsal fin low; caudal slightly emarginate; pectoral extending on to the vent. The diameter of the eye is one-third of the length of the head. Greenish, with five or six cross-bands; a black spot on the last dorsal spines and anterior dorsal rays; operculum with a blackish spot. (*Val.*)

Salt-ditches of the Sahara.

Circumvolutions of the intestines numerous; two pyloric appendages. Herbivorous.

Labrus desfontainii, Lacép. iv. pp. 54, 160, from the hot-springs of Cafsa (Tunis), is, perhaps, a species closely allied to the preceding.

4. HEMICHROMIS.

Hemichromis, *Peters, Monatsber. Berl. Acad.* 1857, p. 403.
Chromichthys, (*Guich.*) *Dumér. Ann. Mus.* x. p. 257.

Body oblong, covered with cycloid scales of moderate size. Dorsal spines numerous, anal spines three; base of the soft dorsal naked; cheeks and opercles scaly. Mouth protractile. Teeth conical, in one or two series above, in one below. Anterior prominences of the first branchial arch short, compressed, horny, bicuspid. Branchiostegals five.

Western parts of tropical Africa.

1. Hemichromis fasciatus.

Hemichromis fasciatus, *Peters, l. c.*
Chromichthys elongatus, *Dumér. l. c.* pl. 22. fig. 3.

D. $\frac{14}{11}$. A. $\frac{3}{9}$. L. lat. 28. L. transv. 3/9.

The two middle teeth in the upper jaw are the longest. Scales on the cheek in five series. The height of the body is somewhat more than the length of the head, and contained twice and two-thirds in the total (without caudal). Snout conical, longer than the eye. Brownish-green, with five or six blackish cross-bands; each scale below the lateral line with a dark vertical streak; a large blackish blotch on the operculum; dorsal and anal fins with more or less distinct oblique and interrupted streaks.

Guinea. River Gaboon.

a–b. Fine specimens. West Africa. Presented by C. Swanzz, Esq.

2. Hemichromis auritus.

Gill, Proc. Acad. Nat. Sc. Philad. 1862, p. 135.

D. $\frac{14}{11}$. A. $\frac{3}{8}$: L. lat. 25. L. transv. 3/9.

The two middle teeth in the upper jaw are considerably longer than the others. Scales on the cheek in four series. The height of the body equals the length of the head, and is contained twice and four-fifths in the total length (without caudal). Snout conical, longer than the eye. Brownish, with five black cross-bands; angle of the operculum with a black spot, partly edged with white; fins immaculate. (*Gill.*)

River Gaboon.

3. Hemichromis bimaculatus.

Gill, Proc. Acad. Nat. Sc. Philad. 1862, p. 137.

D. $\frac{14}{10}$. A. $\frac{3}{9}$. L. lat. 25. L. transv. 3/9.

The two middle teeth of the upper jaw are larger than the others. Scales on the cheek in three series. Snout a little longer than the eye. The dorsal fin commences above the root of the pectoral. Purplish-red, with a vertical black spot below the lateral line, below the twelfth and thirteenth dorsal spines; head immaculate, except a black spot at the angle of the operculum. (*Gill.*)

River Gaboon.

4. Hemichromis guttatus.

D. $\frac{13}{11-12}$. A. $\frac{3}{8}$. L. lat. 26. L. transv. 3/9.

The two middle teeth of the upper jaw are scarcely longer than the others. Scales on the cheek in three or four series. Snout obtuse, scarcely longer than the eye. The dorsal fin commences before the root of the pectoral. Operculum with a large black spot, another on the side of the body; sides of the head with round black spots.

Cape Colony.

a–b. Fine specimens. Purchased of Mr. Stevens.

Description.—The height of the body equals the length of the head, and is less than one-third of the total (the caudal not included). Head a little longer than high, with the upper profile curved; that of the snout is not concave as in *H. fasciatus*. Snout short, scarcely longer than the diameter of the eye, which is two-ninths of the length of the head; cleft of the mouth oblique, of moderate width, with the lower jaw slightly prominent, and with the maxillary extending to below the anterior margin of the eye. Præorbital much narrower than the orbit. Interorbital space rather flat, wider than the orbit. Operculum scaly, terminating in a prominent, rounded, stiff, scaleless black lobe.

The origin of the dorsal falls vertically before the root of the pectorals, and its distance from the caudal is less than the depth of the free portion of the tail. The spines are of moderate length and strength, the length of the twelfth being one-half of that of the head. Some of the middle dorsal and anal rays are slightly produced, so as to extend beyond the base of the caudal. Caudal rounded, shorter than the head. Pectoral rounded, its length being only two-thirds of that of the head. The two outer ventral rays are produced into filaments.

The teeth in both jaws are small, conical, in a single series; there is an incomplete second and posterior series behind the front teeth of the upper jaw. The two middle teeth in the upper jaw are scarcely larger than the others, whilst there is a pair of small but distinct canines in the lower; they are wide apart from each other. The lower pharyngeal plate is longer than broad, and armed with very small conical teeth, those in the middle being rather coarser.

Greenish-olive, with a large black spot immediately below the fourteenth and fifteenth scales of the lateral line. Opercular lobe black; the lower lateral half of the head with rounded black spots; vertical fins with numerous ocelliform light spots, sometimes confluent into oblique streaks. Pectoral and ventral blackish.

Length of the specimens 4½–5 inches.

5. ACARA *.

Acara, pt., *Heck. Brasil. Fluss-Fische in Ann. Wien. Mus.* ii. 1840, p. 338.

Body compressed, oblong, covered with ctenoid scales of rather large size. Dorsal spines numerous, anal spines three or four; base of the soft dorsal naked or slightly scaly. Teeth in a band, small, conical. Anterior prominences of the first branchial arch very short, tubercle-like. The jaws are equal anteriorly, or the lower projects beyond the upper.

Tropical America.

We divide the species of this genus into two groups:—

A. Scales on the cheek in five or less series, p. 276.
B. Scales on the cheek in more than five series, p. 282.

A. Scales on the cheek in five or less series.

1. Acara bimaculata.

Acara, *Marcgr.* p. 168.
Sciæna bimaculata, *L. Mus. Ad. Fried.* i. p. 66.

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* 1. Chromis punctata, *Casteln.* (not *Bl.*) *Anim. nouv. ou rares de l'Amér. Sud. Poiss.* p. 13.—Tocantins.
2. —— lapidifera, *Casteln. l. c.* p. 16. pl. 8. fig. 1.—Araguay.
3. Labrus filamentosus, *Lacép.* iii. p. 477. pl. 18. fig. 2.—*Hab.* —— ?
4. Hoplarchus planifrons, *Kaup, Wiegm. Arch.* 1860. p. 131.

Labrus (brunneus), *Gronov. Mus. Ichthyol.* p. 36. no. 8.
Sparus, sp., *Gronov. Zoophyl.* p. 64. no. 223. tab. 5. fig. 4.
Labrus bimaculatus, *L. Syst. Nat.* i. p. 477.
Perca bimaculata, *Bl.* vi. p. 82. tab. 310. fig. 1.
Cichla bimaculata, *Bl. Schn.* p. 338.
Labrus punctatus, *Bl.* tab. 295; *Bl. Schn.* p. 251.
Chromis tænia, *Benn. Proc. Comm. Zool. Soc.* i. 1830, p. 112; *Storer, Syn. Fish. N. Amer.* p. 68, and *Mem. Am. Acad.* ii. p. 520.
Acara gronovii, *Heck. l. c.* p. 361.
—— punctatus, *Heck. l. c.* p. 360.
—— margarita, *Heck. Brasil. Fluss-Fische,* p. 338.
Cychlasoma tænia, *Gill, Ann. Lyc. Nat. Hist. New York,* vi. *Fish. Trinid.* p. 23 (sep. cop.).

D. $\frac{15}{10-11}$. A. $\frac{4}{8-9}$. L. lat. 24. L. transv. 3/9. Vert. 13/13.

Three series of scales on the cheek. Brown, with a black spot on the middle of the sides, and with a black ocellus edged with whitish superiorly at the root of the caudal fin; generally a dark spot below the orbit; sometimes a blackish band from the eye to the lateral spot; a whitish streak between the eye and nostril.

Guiana. River Guaporé (Brazil). Trinidad.

a. Adult. Trinidad. From the Collection of the Zoological Society. —Type of *Chromis tænia*.
b–e, f, g, h–i, k, l, m, n, o, p–r. British and Dutch Guiana.
s–t. Adult and half-grown. Demerara. Presented by Dr. Hancock.
u–w. Adult: stuffed. Tropical America.
x. Adult: skeleton. From the College of Surgeons.
y. Half-grown: skeleton.

The intestinal tract makes two circumvolutions; there is a cæcal sac, as long as the abdominal cavity, near the entrance of the œsophagus in the stomach. The fourth vertebra of all the species of *Acara* examined has a pair of flat processes on its abdominal surface.

Acara marginatus (Heck. *l. c.* p. 350), with the scales black-edged, appears to be a variety of this species.

2. Acara tetramerus.

Acara tetramerus, *Heckel, Brasil. Fluss-Fische,* p. 341.
—— diadema, *Heckel, l. c.* p. 344.

D. $\frac{15}{10-11}$. A. $\frac{3}{9}$. L. lat. 25. L. transv. 3/9. Vert. 12/12.

Four series of scales on the cheek, in young specimens three. Brown, with a black spot on the middle of the sides, and with a black ocellus edged with whitish superiorly at the root of the caudal fin, the two spots sometimes united by a band; a dark spot below the orbit; a whitish streak between the eye and nostril.

Guiana. Rio Branco (Brazil).

a, b, c, d. Adult, half-grown, and young. Guiana. Presented by Sir R. Schomburgk.
e. Adult: skeleton. Guiana. Presented by Sir R. Schomburgk.

3. Acara brasiliensis.

Chromis brasiliensis, *Quoy & Gaim. Voy. Uran. Zool. Poiss.* p. 286.
? Sciæna punctata, *L. Mus. Ad. Fried.* i. p. 66.
? Labrus punctatus, *L. Syst. Nat.* i. p. 477.
? Chromys unimaculata, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 13. pl. 7. fig. 2.

D. $\frac{14-15}{11-13}$. A. $\frac{3}{9}$. L. lat. 30. L. transv. $\frac{3\frac{1}{2}}{10}$. Vert. 14/15.

Four series of scales on the cheek; operculum entirely scaly. Brownish-olive, with a black spot on the middle of the sides, and with another indistinct blackish blotch above the basal portion of the pectoral; a rather indistinct dark band from the upper part of the eye to the nape of the neck; the posterior part of the dorsal and anal, and the caudal with round whitish spots; no black spot at the root of the caudal.

Fresh waters of Brazil.

a–f. Fine specimens. Bahia. From Dr. O. Wucherer's Collection.
g, h, i. Adult and half-grown. Brazil. Presented by Lord Stuart.
k. Adult: skeleton. Bahia. From Dr. O. Wucherer's Collection.

Description.—The height of the body is contained twice and a third to twice and a fourth in the total length (the caudal not included), the length of the head three times. The nape of the neck is slightly curved, but in the largest specimen (nine inches long) a very prominent soft hump is developed, probably formed by an accumulation of fat. The width of the interorbital space is nearly one-third (in young specimens two-sevenths) of the length of the head, and less than that of the snout. Snout compressed, elevated, the width of the præorbital being twice that of the eye in adult examples, and less in half-grown ones. Cleft of the mouth slightly oblique, not extending to the vertical from the orbit. The fold of the lower lip is interrupted in the middle. The lower limb of the præoperculum much shorter than the posterior. There are twelve series of scales between the throat and the root of the ventral.

Dorsal spines of moderate strength, gradually increasing in length posteriorly; the length of the ninth is one-third, or nearly one-third, of that of the head. The middle of the soft dorsal and anal produced, and extending beyond the middle of the caudal, which is rounded. Pectoral as long as, or somewhat longer than, the head, not extending to the middle of the anal. Ventral filament very long.

4. Acara gymnopoma.

D. $\frac{14}{12}$. A. $\frac{3}{9}$. L. lat. 26. L. transv. $\frac{3\frac{1}{2}}{9}$.

Five series of scales on the cheek; only the upper and anterior margins of the operculum are scaly. Brownish-olive, with a black spot on the middle of the sides; the posterior part of the dorsal and anal, and the caudal with round whitish spots.

Hab. —— ?

a. Five inches long.

Description of the specimen.—This species is very similar to *A. brasiliensis* in general form. The height of its body is contained twice and a third in the total length (the caudal not included), the length of the head three times. The nape of the neck is gently curved, and its profile descends abruptly. The width of the interorbital space equals that of the orbit, is two-sevenths of the length of the head, and less than that of the snout. Snout compressed, moderately elevated, the width of the præorbital being somewhat more than that of the orbit. Cleft of the mouth slightly oblique, not extending to the vertical from the orbit. The fold of the lower lip is interrupted in the middle. The lower limb of the præoperculum is only half as long as the posterior. More than one-half of the operculum is naked, only its upper portion and basal margin being covered with scales larger than those on the cheek. There are twelve series of scales between the throat and the root of the ventral.

Dorsal spines of moderate strength, gradually increasing in length posteriorly; the length of the ninth is somewhat more than one-half of that of the head. The middle of the soft dorsal and anal produced, and extending beyond the middle of the caudal, which is subtruncated. Pectoral rather shorter than the head, extending to the origin of the anal; ventral with a filament.

Brownish-olive, with a black blotch below the ninth and tenth scales of the lateral line; the scales between the origin of the lateral line and the ventrals dark, with steel-blue dots; an indistinct dark band rises from the eye to the nape; the posterior parts of the dorsal and anal, and the caudal with round whitish spots.

It is possible that this species is identical with *Acara heckelii* (Müll. & Trosch. in Schomb. Guiana, iii. p. 624), which is described as follows:—

The lower (?) orbital bone is longer than the diameter of the eye; five series of scales on the cheek; the nostril is situated at one-third of the distance of the eye from the snout. A black spot on the side, below the lateral line; tail without spot; fins dotted with white. D. $\frac{14}{10}$. A. $\frac{3}{8}$.

5. Acara vittata.

Heckel, Bras. Fluss-Fische, p. 346.

D. $\frac{13}{11}$. A. $\frac{3}{8}$. L. lat. 24. L. transv. 2/8.

Three series of scales on the cheek; præorbital as wide as the orbit (in specimens from 3 to 5 inches long); the greatest breadth of the head is three-fifths of its length. Cleft of the mouth rather oblique. A black spot on the middle of the sides, another on the upper part of the root of the caudal; sometimes a blackish band from the gill-opening to the lateral spot; another from the nape of the neck to the orbit, narrower below the eye, and continued to the lower præopercular margin. A light streak from the eye to the nostril.

Province of Matagrosso.

a. Adult. Purchased of Mr. Scrivener.

6. Acara pulchra.

Cychlasoma pulchrum, *Gill, Freshwater Fish. Trinid. in Ann. Lyc. Nat. Hist. New York*, 1858, sep. cop. p. 22.
Chromis rivulata, *Günth. Proc. Zool. Soc.* 1859, p. 418.

D. $\frac{13}{11}$. A. $\frac{3}{8}$. L. lat. 28. L. transv. 3/9.

Four (in young specimens three) series of scales on the cheek; præorbital wider than the eye in adult specimens, and as wide as the orbit in young ones; the greatest breadth of the head is contained once and four-fifths in its length. Cleft of the mouth very slightly oblique. A black spot on the middle of the sides; no caudal spot; sides of the head with oblique bluish lines, which are replaced by spots of the same colour on and behind the opercles. Young specimens with distinct dark cross-bands, and with a dark spot below the orbit.

Trinidad. Western Ecuador.

a. Five and a half inches long. Western Ecuador. From Mr. Fraser's Collection.
b–d. Half-grown and young. Western Ecuador. From Mr. Fraser's Collection.

7. Acara dorsigera.

Heckel, Brasil. Fluss-Fische, p. 348.

D. $\frac{14}{9}$. A. $\frac{3}{8}$. L. lat. 24.

Three series of scales on the cheek; præorbital half as wide as the orbit (in specimens two inches long); the greatest breadth of the head is two-thirds of its length, which is contained once and a quarter in the height of the body. A blackish band runs from the eye to the lateral spot; there is another black spot above the latter, on the eighth to ninth dorsal spines. Caudal spot none. Caudal and posterior part of the soft dorsal dotted with white. (*Heck.*)

Paraguay.

8. Acara viridis.

Heckel, Brasil. Fluss-Fische, p. 343.

D. $\frac{15}{10}$. A. $\frac{3}{9}$. L. lat. 26.

Three series of scales on the cheek; præorbital as wide as the orbit (in specimens five and a half inches long); the greatest breadth of the head is two-thirds of its length. Cleft of the mouth horizontal. Brownish, with six darker cross-bands; a seventh round the free portion of the tail; a black spot on the middle of the sides; another smaller one superiorly at the root of the caudal; a light streak between the eye and nostril. Fins immaculate. (*Heck.*)

Ditches near the town of Matagrosso.

9. Acara pallida.

Heckel, Brasil. Fluss-Fische, p. 347.

D. $\frac{16}{10}$. A. $\frac{3}{8}$. L. lat. 26.

Three series of scales on the cheek; præorbital half as wide as the orbit (in specimens three and a quarter inches long); head half as broad as long, and nearly as long as the body is high. Cleft of the mouth subhorizontal, with the jaws equal anteriorly; the maxillary extends to below the anterior margin of the orbit. A black spot on the sides and a small one on the upper part of the base of the caudal. (*Heck.*)

Rio Negro.

10. **Acara uniocellata.**

Chromys uniocellata, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 15. pl. 6. fig. 1.

D. $\frac{15}{10}$. A. $\frac{3}{7}$.

Scales on the cheek apparently in three series. Brownish, with a black ocellus on the back of the tail. Sides without spot. (*Cast.*)

Ucayale (Peru).

11. **Acara obscura.**

Chromys obscura, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 14. pl. 6. fig. 3.

D. $\frac{14}{12}$. A. $\frac{3}{8}$.

Scales on the cheek apparently in three or four series. The height of the body is a little more than one-half of the total length (without caudal). Uniform dark-brown. (*Cast.*)

Rio Paraguassu (Bahia).

12. **Acara (?) ucayalensis.**

Chromys ucayalensis, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 15. pl. 6. fig. 2.

D. $\frac{11}{13}$. A. $\frac{3}{10}$.

Scales on the cheek apparently in three series. Body immaculate, vertical fins spotted. (*Cast.*)

Sarayacu.

13. **Acara dimerus.**

Heckel, Brasil. Fluss-Fische, p. 351.

D. $\frac{15}{10}$. A. $\frac{3}{10}$. L. lat. 25.

Scales on the cheek in two series; the præorbital is not as wide as the orbit (in specimens nearly four inches long); the greatest breadth of the head is two-thirds of its length, which is less than the height of the body. Body with darker cross-bands, with a black lateral spot, and with another at the root of the caudal. (*Heck.*)

River Cujaba.

14. **Acara nassa.**

Heckel, Brasil. Fluss-Fische, p. 353.

D. $\frac{13}{9}$. A. $\frac{3}{9}$. L. lat. 23. L. transv. $\frac{3\frac{1}{2}}{8}$.

Three series of scales on the cheek. Præorbital only half the width of the orbit: maxillary extending to behind the front margin of the eye; lower jaw prominent. Coffee-brown, with a black spot on the middle of the sides, and with another at the root of the caudal. A black spot below the orbit, and another edged with bluish on the angle of the præoperculum.

Fresh waters of Brazil and Guiana.

a. Fine specimen. River Cupai. Purchased of Mr. Stevens.

Acara cognatus, Heckel, *l.c.* p. 356, and *Acara unicolor*, Heckel, *l.c.* p. 357, the latter without any markings, are probably identical with *A. nassa*.

B. Scales on the cheek in more than five series.

15. Acara adspersa.

D. $\frac{15}{12}$. A. $\frac{4}{9}$. L. lat. 31. L. transv. 6/13.

The fold of the lower lip continuous in the middle; six series of scales on the cheek. The height of the body is two-fifths of the total length (without caudal). Only a narrow strip of the base of the soft dorsal is scaly. Brownish-olive, dotted all over with black.

Barbadoes.

a. Eight inches long. Presented by Sir R. Schomburgk.

Description of the specimen.—The height of the body is two-fifths of the total length (the caudal not included), the length of the head somewhat more than one-third. Head as high as long, with the upper profile of the snout straight, that of the nape being strongly convex. Snout compressed, large, its extent being two-fifths of the length of the head. Cleft of the mouth oblique, not extending to below the anterior margin of the eye, with the jaws equal anteriorly. Præorbital nearly as wide as the interorbital space, and much wider than the orbit. The eye is situated in the middle of the length of the head, near the upper profile; its diameter is one-sixth of the length of the head. Space between the orbits convex. Scales ctenoid; those on the cheek small, in six horizontal and seven vertical series.

Only a very narrow portion of the base of the vertical fins is scaly. Dorsal spines moderately strong, the length of the twelfth being one-fourth of that of the head; the middle of the soft dorsal and anal are prolonged into a very long filament; caudal rounded. Pectoral rounded, equal in length to the distance of the snout from the posterior margin of the eye. Ventral with the outer ray prolonged into a filament reaching to the anal papilla.

Brownish-olive, dotted all over with black, except on the pectoral, ventral and anal fins, which are immaculate.

16. Acara fusco-maculata.

Centrarchus tetracanthus, *Cuv. & Val.* vii. p. 460.
Chromis fusco-maculatus, *Guich. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 78. pl. 2. fig. 3.

D. $\frac{15}{12}$. A. $\frac{4}{9}$. L. lat. 31. L. transv. 6/11.

The fold of the lower lip continuous in the middle; seven series of scales on the cheek. The height of the body is two-fifths of the total length (without caudal). A large portion of the soft dorsal is scaly. Brownish, with series of brown spots.

Cuba.

a. Six inches long. From the Collection of the Zoological Society.

Description of the specimen.—The height of the body is two-fifths of the total length (the caudal not included), the length of the head one-third. Head as long as high, with the upper profile concave above the eyes. Snout of moderate extent, its length being one-third of that of the head. Cleft of the mouth very oblique, not extending to below the anterior margin of the eye; lower jaw prominent. Præorbital rather narrower than the orbit, the diameter of which is two-ninths of the length of the head. The interorbital space is wider than the orbit, and its naked portion is flat. Eye situated immediately below the upper profile, nearer to the extremity of the snout than to that of the operculum. Scales ctenoid; those on the cheek small, in seven horizontal and ten vertical series.

Basal portion of the vertical fins scaly. Dorsal spines rather feeble, the length of the twelfth being nearly one-third of that of the head. The soft dorsal and anal are somewhat elevated in the middle, extending slightly beyond the base of the caudal. Anal spines of moderate length and strength. Caudal rounded. Pectoral rounded, equal in length to the distance of the snout from the posterior margin of the præoperculum. Ventral pointed, not extending on to the vent.

The teeth in the jaws form a band, those in the outer series being enlarged. The lower pharyngeal somewhat longer than broad, with short cardiform teeth, those in the middle of its posterior half being obtusely conical or molar-like.

Brownish: each scale with a dark-brown spot at the base, the spots forming longitudinal series; margins of the præoperculum with several similar spots; a pair of dark-brown spots in the axil of the pectoral, one superiorly, the other inferiorly. Dorsal fin with obsolete brown spots, the other fins immaculate.

Poey has shown that *Centrarchus tetracanthus*, Cuv. & Val.*, established from a drawing, is identical with Guichenot's fish. This is another instance of the difficulty of well establishing a species from a drawing. It could easily be shown that at least one-half of such species have turned out to be either identical with others, or have not been recognized by other writers. Science itself has never derived any advantage from such a practice, but has been encumbered by it with a number of doubtful species and useless synonyms.

17. Acara unipunctata.

Chromys unipunctata, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 13. pl. 8. fig. 2.

D. $\frac{13}{11}$. A. $\frac{3}{7}$.

Scales on the cheek small, in more than five series. Yellowish, with a black lateral spot. Caudal spotted. (*Cast.*)

Rio Paraguassu (Bahia).

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* This species, *Centrarchus* no. 10, of the first volume of this work, p. 258, must be erased.

6. THERAPS.

Body compressed, oblong, covered with ctenoid scales of moderate size. Dorsal spines numerous, anal spines three or four. Teeth in a band, conical. Anterior prominences of the first branchial arch short horny processes. Cleft of the mouth short, with the upper jaw longest. Scales on the cheek small, in more than five series. Dorsal fin not scaly.

Guatemala.

1. Theraps irregularis.

D. $\frac{16}{13}$. A. $\frac{4}{9}$. L. lat. 35. L. transv. 4/14.

Six series of scales on the cheek.

Guatemala.

a. Six inches long. Guatemala. From Mr. O. Salvin's Collection.

Description of the specimen.—The height of the body equals the length of the head, and is two-sevenths of the total (the caudal fin not included). Head longer than high, with the snout compressed and prominent; the length of the snout is two-fifths of that of the head, and nearly twice the width of the orbit. The cleft of the mouth is rather small, extending backwards somewhat behind the vertical from the nostril; upper jaw slightly overlapping the lower; teeth in a narrow band, those of the outer series largest. Præorbital somewhat wider than the orbit, its width being equal to that of the interorbital space, which is rather convex. The eye is situated immediately below the upper profile, its centre being a little behind the middle of the length of the head. Scales on the cheek small, in six oblique series. The posterior limb of the præoperculum is longer than the inferior and descends obliquely forwards. Scales on the opercles as large as those on the neck; those near the base of the dorsal and on the abdomen very small. Scales ctenoid.

The dorsal fin commences above the root of the ventral, and is not scaly. The spines are of moderate length and strength, the length of the fifteenth being two-sevenths of that of the head. The soft portion does not extend to the caudal, if laid backwards; the distance between dorsal and caudal equals that of the extremity of the snout from the posterior margin of the orbit. Caudal rounded. Pectoral shorter than the head. The ventral spine is only half as long as the fin, and enveloped in skin together with the first soft ray; the fin does not extend on to the vent.

Reddish-olive, marbled with blackish; the latter colour forming seven rather irregular transverse bands, some of which extend on the dorsal fin. Belly silvery, marbled with blackish; opercles and some scales on the body with blue dots.

The outer branchial arch is provided with short horny processes. Lower pharyngeal broader than long, the lateral halves not being very firmly united; it is armed with villiform teeth, and with two rows of stronger conical teeth along the middle.

7. HEROS *.

Heros, pt., *Heck. Brasil. Fluss-Fische in Ann. Wien. Mus.* ii. 1840, p. 362.
Herichthys, *Baird & Girard in Proc. Acad. Nat. Sc. Philad.* 1854, p. 25.
Hoplarchus, pt., *Kaup, Wiegm. Arch.* 1860, p. 128.

Body compressed, oblong, covered with ctenoid scales of moderate size. Dorsal spines numerous, anal spines more than four; base of the soft dorsal scaly or sometimes naked. Teeth in a band, small, conical. Anterior prominence of the first branchial arch short horny processes. Cleft of the mouth of moderate width. Scales on the cheeks small, *generally* in more than four series. The origin of the ventral falls vertically behind that of the dorsal.

Central and South America.

1. Heros parma.

D. $\frac{17}{12-13}$. A. $\frac{6}{9-10}$. L. lat. 31. L. transv. 5/13.

The fold of the lower lip interrupted in the middle; five or six series of scales on the cheek. The height of the body is about one-half of the total length (without caudal). Brownish, with seven cross-bands.

Mexico. Guatemala.

a–c. From seven to nine inches long. Mexico. From the Berlin Museum (as *H. deppii*).
d–g. From three to seven inches long. Guatemala. From Mr. O. Salvin's Collection.

Description.—The height of the body is one-half of the total length (without caudal), in the largest specimen rather more than one-half, and in the young ones somewhat less; the length of the head is one-third of the total, or a little less than one-third. Head rather higher than long, with the nape very convex in adult specimens. Snout of moderate extent, compressed, more or less elevated, much longer than the eye. Cleft of the mouth slightly oblique, with the jaws equal anteriorly, and with the maxillary hidden below the præorbital and not extending to below the front margin of the orbit. Jaws rather protractile, armed with a broad band of villiform teeth, the teeth of the outer series being enlarged. Præorbital wider than the orbit. Interorbital space very convex, wider than the orbit. Eye nearly in the middle of the length of the head.

Base of the soft dorsal and anal with a few small scales. Dorsal spines of moderate length and strength: the length of the twelfth is rather less than one-half of that of the head in adult specimens, and exactly one-half in young ones. The soft dorsal and anal are elevated; caudal rounded. Pectoral rounded, not much shorter than the head. The outer ventral ray prolonged, less so in young individuals.

Brownish- or greenish-olive, with seven very indistinct dark cross-bands. The specimens from Guatemala have a large black blotch on the middle of the root of the caudal. Fins dark-brown in adult specimens, lighter in young ones and with a few scattered dark dots.

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* 1. Chromys fasciata, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 17. pl. 9. fig. 2. Araguay.

2. Heros fenestratus.

Chromis fenestrata, *Günth. Proc. Zool. Soc.* 1860, p. 318.

D. $\frac{(16)17}{12}$. A. $\frac{(5)6}{9}$. L. lat. 33. L. transv. 6/13. Vert. 14/15.

The fold of the lower lip is interrupted in the middle; five series of scales on the cheek. The height of the body is one-half, or rather less than one-half, of the total length (without caudal). A black band from above the pectoral to the root of the caudal.

Mexico.

a–b. Types of the species. Rio de la Lana. From M. Sallé's Collection.
c–d. Fine specimens. Mexico. From M. Sallé's Collection.
e. Fine specimen. Mexico. Purchased of Mr. Cuming.
f. Adult: skeleton. Mexico. Purchased of Mr. Cuming.

Description.—The height of the body is one-half, or rather less than one-half, of the total length (without caudal), the length of the head one-third. Head as high as long; snout of moderate extent, slightly elevated, the præorbital being somewhat wider than the orbit. Cleft of the mouth small, horizontal, with the jaws equal anteriorly. The eye is situated below the upper profile, nearer to the extremity of the snout than to that of the operculum. Interorbital space convex, wider than the orbit. Vertical fins very slightly scaly at the base; dorsal spines moderately strong, the length of the twelfth being two-fifths of that of the head; the soft dorsal and anal are pointed, their points not extending to the middle of the caudal. Caudal rounded. The distance between the dorsal and caudal is less than the greatest depth of the free portion of the tail. Pectoral shorter than the head; ventral pointed.

Brownish-green, with six dark cross-bands, less distinct in old individuals than in young ones, crossing a deep-black longitudinal band which runs from above the pectoral to the middle of the root of the caudal. Vertical and ventral fins blackish, darkest at the base and margins.

Length of the largest specimen 6 inches.

The *skeleton* of *Heros* scarcely differs from that of *Acara*. Twice, in our skeleton of the present species, the centra of two vertebræ are confluent into one, whilst the apophyses remain separate.

3. Heros temporalis.

D. $\frac{17}{12}$. A. $\frac{7}{9}$. L. lat. 31. L. transv. $\frac{4\frac{1}{2}}{11}$.

The fold of the lower lip interrupted in the middle; five series of scales on the cheek. The height of the body is one-half of the total length (without caudal). A large brownish-black blotch behind the eye, a black spot on the root of the caudal.

Hab. ——?

a. Six and a half inches long. From the Collection of the Zoological Society.

Description of the specimen.—The height of the body is one-half of the total length (the caudal not included), the length of the head somewhat more than one-third. Head as long as high, with the snout of moderate extent; the length of the latter is contained twice and a fourth in that of the head, or equal to twice the diameter of the eye. The cleft of the mouth is oblique, with the lower jaw slightly prominent, and with the maxillary hidden below the præorbital and not extending to below the front margin of the eye. Jaws protractile, armed with a broad band of villiform teeth, the teeth of the outer series being enlarged. Præorbital as wide as the orbit. The profile above the eye is curved, and the interorbital space very convex. Eye somewhat nearer to the extremity of the operculum than to that of the snout. Scales ctenoid; those on the cheek not much smaller than those on the opercles.

Basal portion of the vertical fins scaly. Dorsal spines of moderate strength and length; the length of the twelfth is rather more than one-third of that of the head. The soft dorsal and anal are elevated on the middle, extending to the middle of the caudal. Caudal rounded. Pectoral rounded, equal in length to the distance of the snout from the posterior margin of the orbit. The outer ventral ray is prolonged into a filament extending to the sixth anal spine.

Brownish: dark on the back, light on the lower parts. A brownish-black blotch occupies the space between the eye and the upper part of the gill-opening; there is a crescent-shaped yellowish spot above it. A rounded blackish spot at the base of the caudal, above the end of the lateral line; an indistinct dark band appears to run from the spot on the head towards that of the caudal, and to be joined by several cross-bars descending from the back. Fins uniform.

4. Heros margaritifer.

D. $\frac{17}{11}$. A. $\frac{7}{9}$. L. lat. 31. L. transv. 5/13.

The fold of the lower lip is slightly interrupted in the middle; five or six series of scales on the cheek. The height of the body is rather less than one-half of the total length (without caudal). Brownish-olive, with seven black cross-bands, each band with pearl-coloured spots.

Guatemala.

a. Six and a half inches long. Lake Peten. From the Collection of Messrs. Salvin and Godman.

Description of the specimen.—Head rather higher than long, its length being one-third of the total (without caudal). There is a fleshy hump on the nape of the neck, which is probably a character of mature age. Snout compressed, rather high, of moderate extent, its length being contained twice and a fourth in that of the head. Præorbital much wider than the orbit, the diameter of which is one-half of the length of the snout. Cleft of the mouth slightly oblique, with the lower jaw a little prominent beyond the upper; the maxillary is hidden below the præorbital, and does not extend to the front margin of the eye. Jaws protractile, armed with a broadish band of villiform teeth, those of the outer series being the larger. Eye nearer to the extremity of the operculum than to that of the snout. Scales on the cheek not much smaller than those on the opercles.

The soft portions of the vertical fins have a few small scales at the base. Dorsal spines of moderate strength and length, the length of the twelfth being contained twice and a third in that of the head. The soft dorsal and anal are somewhat elevated in the middle, extending to the base of the caudal. The free portion of the tail is as long as high. Caudal fin slightly emarginate, with the lobes rounded, one-fifth of the total length. Pectoral shorter than the head, extending to the third anal spine. The outer ventral ray is produced into a short filament.

Brownish-olive, with seven black cross-bands: the first in front of the dorsal fin; the second to the fifth below the spinous dorsal, partly extending on the fin; the sixth below the end of the dorsal; the seventh across the free portion of the tail. Each of these cross-bands has numerous pearl-coloured spots. Root of the caudal with a blackish spot.

5. **Heros melanurus.**

D. $\frac{17}{11}$. A. $\frac{6}{8}$. L. lat. 33. L. transv. 5/13.

The fold of the lower lip is subinterrupted in the middle*; five series of scales on the cheek. The height of the body is contained twice and a third or twice and a half in the total length (without caudal). A deep-black band along the middle of the tail; the lower parts black in adult specimens.

Guatemala.

a–e. From three to ten inches long. Lake Peten. From the Collection of Messrs. Godman and Salvin.

Description.—Head higher than long, its length being nearly one-third of the total (without caudal). There is a fleshy hump on the nape of the neck of the two largest specimens. Snout compressed, rather high, of moderate extent, its length being two-fifths or one-third of that of the head. Præorbital wider than the orbit. Cleft of the mouth oblique, with the lower jaw scarcely prominent. The maxillary does not extend to the vertical from the front margin of the eye. Jaws protractile, armed with a broad band of villiform teeth, those of the outer series being the larger and brown at the tip. Eye as distant from the extremity of the snout as from that of the operculum. Scales on the cheek considerably smaller than those on the opercles.

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* The fold is distinctly interrupted in specimens from six to ten inches long, whilst it appears to be slightly continuous in young individuals of three to four inches in length.

Vertical fins scaleless. Dorsal spines of moderate strength and length, the length of the twelfth being one-third of that of the head; the soft dorsal and anal extend somewhat beyond the root of the caudal. The free portion of the tail is nearly as long as high. Anal spines strong and long. Caudal rounded, one-fifth of the total length. Pectoral shorter than the head, extending nearly to the origin of the anal fin. The distance of the vent from the root of the ventral is three-quarters of the length of the head.

Orange-coloured or purplish-brown, with a more or less irregular deep-black band along the middle of the tail; sometimes a series of more or less confluent black blotches on the back. Mature specimens have the whole of the lower parts of the head, belly and tail deep black. Dorsal, caudal and pectoral orange-coloured or purplish-brown, with a few scattered spots posteriorly; anal and ventral black.

Young specimens have no black, except the band on the tail; their dorsal spines are proportionally longer, the length of the twelfth being contained twice and a fourth in that of the head.

6. Heros spilurus.

D. $\frac{18}{10}$. A. $\frac{8\text{–}9}{7\text{–}8}$. L. lat. 29. L. transv. $\frac{4\frac{1}{2}}{11}$.

The fold of the lower lip is interrupted in the middle; four series of scales on the cheek. No spot on the temple; a large black spot on the middle of the root of the caudal.

Guatemala.

a–b. From Mr. O. Salvin's Collection.

Description.—The height of the body is one-half of the total length (without caudal), the length of the head nearly one-third. Head a little higher than long; snout of moderate extent, its length being two-fifths of that of the head. The diameter of the eye is two-sevenths of the length of the head, two-thirds of that of the snout, and less than the width of the interorbital space, which is convex; the eye is situated below the upper profile, a little nearer to the extremity of the operculum than to that of the snout. Præorbital as wide as the orbit. Cleft of the mouth very narrow, scarcely oblique, with the jaws equal anteriorly. Opercles scaly.

Vertical fins scaly at the base. Dorsal spines of moderate length and strength, the length of the twelfth being contained twice and a third in that of the head. The points of the soft dorsal and anal extend to the middle of the caudal. Caudal rounded. The distance between dorsal and caudal is less than the depth of the tail. Pectoral nearly as long as the head, extending to the fourth anal spine; the outer ventral ray prolonged into a short filament.

Greenish-olive, with nine dark vertical bands; a large, roundish black spot on the middle of the root of the caudal. Caudal and the posterior part of the dorsal and anal with whitish spots.

Length of the largest specimen $3\frac{1}{2}$ inches.

7. Heros cyanoguttatus.

Herichthys cyanoguttatus, *Baird & Girard in Proc. Acad. Nat. Sc. Philad.* 1854, p. 25, and *Rep. U.S. & Mex. Bound. Surv. Fishes,* p. 30. pl. 4. figs. 9–12.

D. $\frac{16}{10}$. A. $\frac{5-6}{7-8}$. L. lat. 26. L. transv. 4/13.

The fold of the lower lip is subcontinuous in the middle; scales on the cheek in four series. The height of the body is a little less than one-half of the total length (without caudal). Snout subconical, detached from the frontal line by a depression above the eye. Brownish, with small bluish spots scattered all over the body and fins. A black blotch is sometimes observable on the middle of the spinous portion of the dorsal, and another on the dorsal region below the former. A third black blotch at the base of the caudal. Young specimens with dark cross-bands.

Mexico and Texas.

a–b. Adult and half-grown. Matamoras. Presented by the Smithsonian Institution.

8. Heros facetus.

Chromis facetus, *Jenyns, Voy. Beagle, Fishes,* p. 104.

D. $\frac{15}{10}$. A. $\frac{6}{8}$. L. lat. 25–26. L. transv. 4/9.

The fold of the lower lip is interrupted in the middle; four series of scales on the cheek. The height of the body is less than one-half of the total length (without caudal). The width of the interorbital space equals nearly two and a half diameters of the eye. Uniform brown.

Maldonado, Rio Plata.

The characters have been taken from the typical specimen, which is preserved in the Collection of the Philosophical Society of the University of Cambridge.

9. Heros psittacus.

Heros psittacus, *Heckel, Brasil. Fluss-Fische,* p. 369.

? Hoplarchus pentacanthus, *Kaup; Wiegm. Arch.* 1860, p. 129. taf. 6. fig. 1.

D. $\frac{15}{11}$. A. $\frac{5}{9}$. L. lat. 40.

The fold of the lower lip is continuous in the middle; scales on the cheek very small, in ten series. The length of the head is contained once and a quarter in the depth of the body, and thrice and a half in the total length. Præoperculum notched. The cleft of the mouth is slightly oblique, the maxillary extending nearly to the vertical from the front margin of the eye. Light-brownish: upper parts with reticulated lines, passing into five bands across the lower parts; tail with two brown cross-bands. A dark-brown band from the occiput to the eye; a series of dark-brown spots from the operculum to the upper part of the root of the caudal; a narrow streak of the same colour from the mouth to the angle of the præoperculum. (*Heck.*)

Rio Negro.

Hr. Kaup, to whom the labours of Heckel and of Müller and Troschel on the present family—nay, the family itself—are unknown, describes a genus of fishes, *Hoplarchus*, composed of a species of *Heros* and of one of *Acara*. The former appears to be identical with *H. psittacus*, Heck. With regard to the figure, it must be remarked, that the greater part of the scales are lost in the typical specimen, and that Hr. Kaup says of the lateral line, that it *may* have been formed by eighteen scales.

10. **Heros urophthalmus.**

D. $\frac{17}{11}$. A. $\frac{6}{9}$. L. lat. 28. L. transv. 5/12.

The fold of the lower lip is continuous in the middle. Scales on the cheek in six series. Body with seven dark cross-bands; a large black ocellus on the base of the caudal fin.

Guatemala.

a–c. Fine specimens (seven inches long). Lake Peten. From the Collection of Messrs. Salvin and Godman.

Description.—The height of the body is contained twice and a half or twice and a quarter in the total length (without caudal), the length of the head nearly three times. Head as high as long; snout rather elevated, with the cleft of the mouth oblique and with the lower jaw prominent. Teeth in narrow bands, those of the outer series enlarged, with brown tips. The maxillary extends nearly to the vertical from the front margin of the eye; præorbital as wide as the orbit, the diameter of which is less than the extent of the snout, and contained four times and a half in the length of the head. Interorbital space flat, wider than the orbit. The eye is situated immediately below the upper profile, nearer to the extremity of the snout than to that of the operculum. Opercles scaly, the scales being larger than those on the cheek; suboperculum with two series of scales.

Dorsal and anal fins scaleless; dorsal spines of moderate length and strength, the length of the twelfth being two-fifths of that of the head; the points of the soft dorsal and anal extend to, or nearly to, the middle of the caudal fin. The free portion of the tail is higher than long. Caudal rounded, its length being contained four times and a third in the total. Anal spines strong and long. Pectoral rounded, extending to the third anal spine; the outer ventral ray produced. The distance between the vent and the root of the ventral is three-fifths of the length of the head.

Brownish- or greenish-olive, with seven blackish cross-bands, as broad as the interspaces between: the first descending obliquely backwards, across the nape; the second, third and fourth below the spinous dorsal, the fifth below the anterior, the sixth below the posterior dorsal rays; the seventh across the free portion of the tail. A large black, white-edged ocellus on the root of the caudal. Fins blackish; pectoral yellowish towards the base.

11. Heros aureus.

D. $\frac{16}{9}$. A. $\frac{7}{8}$. L. lat. 33. L. transv. 6/13.

The fold of the lower lip is continuous in the middle. Scales on the cheek in five series. Base of the dorsal scaleless.

Guatemala. (Mexico.)

a. Guatemala. From Mr. O. Salvin's Collection.
? *b*. Young. Mexico. From M. Sallé's Collection.

Description of the specimen.—The height of the body is contained twice and a third in the total length (without caudal), the length of the head three times. Head as high as long; snout somewhat elevated, with the cleft of the mouth very oblique and with the jaws equal anteriorly; præorbital as wide as the orbit, the diameter of which is contained thrice and a third in the length of the head, and is more than the width of the interorbital space. The eye is situated immediately below the upper profile, a little nearer to the extremity of the operculum than to that of the snout. Opercles scaly; suboperculum rather broad, with two series of scales.

Dorsal and anal fins entirely scaleless; dorsal spines rather slender, the length of the twelfth being a little less than one-half of that of the head; the points of the soft dorsal and anal extend to the middle of the caudal. The distance between the dorsal and caudal is somewhat less than the greatest depth of the free portion of the tail. Caudal slightly emarginate. The pectoral extends to the soft anal; ventral pointed. The distance between the vent and the root of the ventral is one-third of the length of the head.

Yellowish-olive, with six dark cross-bands, extending downwards to a yellow longitudinal band running from above the pectoral to the lower half of the base of the caudal. The third cross-band terminates in a large black lateral spot; sides of the head with several bluish dots, and with a blackish spot on the operculum and suboperculum, darkest on the latter bone. Fins light-coloured, immaculate.

The length of the typical specimen is 57 lines.

12. Heros affinis.

D. $\frac{16}{8-9}$. A. $\frac{8-9}{8-7}$. L. lat. 29. L. transv. 5/12.

The fold of the lower lip is continuous in the middle. Scales on the cheek in four series. Base of the dorsal scaleless. Eye nearer to the end of the operculum than to that of the snout. A black spot in the middle of the side.

Guatemala.

a–d. From $3\frac{1}{2}$ to $5\frac{1}{2}$ inches long. Lake Peten. From the Collection of Messrs. Salvin and Godman.

Description.—The height of the body is contained twice and two-fifths in the total length (without caudal), the length of the head twice and three-fourths. Head as high as long; snout compressed, elevated, with the cleft of the mouth oblique and with the lower jaw prominent. Præorbital wider than the orbit (in the larger individuals), the diameter of which equals the width of the interorbital space; the eye is considerably nearer to the extremity of the operculum than to that of the snout. Opercles scaly; suboperculum with two or three series of small scales.

Dorsal and anal fins entirely scaleless; dorsal spines rather strong and long, the length of the twelfth being two-fifths of that of the head. Anal spines very strong. The middle of the soft dorsal and anal is sometimes produced into a long filament, extending beyond the middle of the caudal. The free portion of the tail is a little higher than long. Caudal slightly emarginate, two-ninths of the total length. Pectoral nearly as long as the head, extending to the middle of the soft anal; the outer ventral ray is produced. The distance between the vent and the root of the ventral is one-third of the length of the head.

Olive, with five or six dark cross-bands, the middle of which has a deep-black spot where it passes the lateral line; a more or less distinct black spot on the suboperculum; sides of the head and vertical fins with bluish, dark-edged ocelli.

This species is very closely allied to *H. aureus*, but may be distinguished from it by larger scales, by a more backward position of the eyes, by stronger spines, &c.

13. Heros spurius.

Heros severus, *Heckel, Bras. Fluss-Fische,* p. 362.
—— coryphæus, *Heckel, l. c.* p. 364.
—— modestus, *Heckel, l. c.* p. 366.
—— spurius, *Heckel, l. c.* p. 368.
? Chromys appendiculata, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 15. pl. 7. fig. 3.

D. $\frac{(15)16}{13-14}$. A. $\frac{(7)8}{11-12}$. L. lat. 29. L. transv. $\frac{5\frac{1}{2}-6\frac{1}{2}}{13-14}$.

The fold of the lower lip continuous in the middle; five series of scales on the cheek. The height of the body is more than one-half of the total length (without caudal). A dark vertical band between the dorsal and anal, terminating in a blackish spot on the root of the anterior dorsal and on that of the posterior anal rays. The remainder of the fish either nearly uniform dark-brown, or lighter with more or less distinct vertical bands; head with short vermiculated lines; body with series of brown dots.

Fresh waters of Brazil and Guiana.

a–b. Fine specimens. River Cupai. Purchased of Mr. Stevens.—Dark variety.

c. Fine specimen. Guiana. Presented by Sir R. Schomburgk.—Light variety.

Fine specimen. From the Collection of the Zoological Society. Light variety.

14. Heros efasciatus.

Heckel, Brasil. Fluss-Fische, p. 372.

D. $\frac{16}{13}$. A. $\frac{7}{13}$. L. lat. 30.

The fold of the lower lip continuous in the middle; scales on the cheek in six series. Brownish-yellow, each scale darker at the base; dorsal and caudal fins with series of dots. (*Heck.*)

Rio Negro.

Perhaps only another variety of *H. spurius*.

15. Heros friedrichsthalii.

Heckel, Brasil. Fluss-Fische, p. 381.

D. $\frac{18}{9-10}$. A. $\frac{8-9}{9-7}$. L. lat. 31. L. transv. 4/12.

The fold of the lower lip continuous in the middle; scales on the cheek in seven series. Yellowish-olive, with six or seven blackish cross-bands; a black band from the eye to the upper part of the root of the caudal, interrupted by the interspaces between the cross-bands; the origin and end of this band are edged with yellow; suboperculum with a black ocellus; an oblique black streak from the eye towards the ocellus.

Central America.

a–b. Fine specimens. Lake Peten (Guatemala). From the Collection of Messrs. Godman and Salvin.

16. Heros salvini.

D. $\frac{17}{10}$. A. $\frac{8-9}{7}$. L. lat. 29. L. transv. 5/10.

Fold of the lower lip continuous in the middle; scales of the cheek in five series. Base of the soft dorsal scaly.

Guatemala.

a–c. Fine specimens. River de Santa Isabel. From the Collection of Messrs. Godman and Salvin.

d–e. Fine specimens. Lake Peten. From the Collection of Messrs. Godman and Salvin.

Description.—This species is closely allied to *H. friedrichsthalii*, but appears to have larger and fewer scales on the cheek. It has a peculiar physiognomy, like that species, in consequence of the concave upper profile of the snout, which is turned upwards. The height of the body is contained twice and a fourth in the total length (without caudal), and the length of the head twice and three-fourths. Head somewhat longer than high; snout of moderate extent, longer than the eye, pointed, with the cleft of the mouth very oblique, and with the lower jaw projecting; the maxillary does not quite extend to the vertical from the anterior margin of the orbit. Præorbital narrower than the orbit. The width of the orbit is one-fourth of the length of the head, and equal to that of the interorbital space.

The eye is situated immediately below the upper profile, in the middle of the length of the head. Opercles scaly; suboperculum of moderate width, with one series of scales.

The vertical fins are scaly at the base; dorsal spines of moderate length, the length of the twelfth being two-fifths of that of the head. The points of the soft dorsal and anal extend beyond the middle of the caudal. Caudal rounded. The distance between dorsal and caudal is considerably less than the depth of the free portion of the tail. The pectoral is much shorter than the head, and extends to the fifth anal spine; ventral pointed. The distance between the vent and the root of the ventrals is two-fifths of the length of the head.

Dark-greenish-olive, with a black band, edged with yellow, running from the snout, through the eye, to the root of the caudal; it is most distinct on the head, but interrupted on the tail by lighter interspaces; it passes a black lateral spot, and, in young specimens, terminates in another black spot. A blue horizontal line below the orbit; a more or less distinct black ocellus on the suboperculum. Fins blackish, immaculate. The sides below the black band are sanguineous in mature specimens.

The largest specimen is $4\frac{1}{2}$ inches long.

17. Heros microphthalmus.

D. $\frac{18}{13}$. A. $\frac{5\text{–}6}{10\text{–}9}$. L. lat. 34. L. transv. 5/14.

The fold of the lower lip is continuous in the middle; six series of scales on the cheek. Brownish, with indistinct dark cross-bands, and with a dark band along the sides and tail, terminating at a black spot in the middle of the root of the caudal. Each scale on the lateral and lower parts with a purple spot at the base. The soft portions of the vertical fins with series of blackish dots; axil of the pectoral orange-coloured.

Guatemala.

a–c. Seven and eight inches long. From the Collection of Messrs. Godman and Salvin.

Description.—The height of the body is contained twice and a third in the total length (without caudal), the length of the head thrice and a third. Head as high as long; snout of moderate extent; præorbital wider than the eye, the diameter of which is one-fifth, or rather less than one-fifth, of the length of the head. Cleft of the mouth rather narrow, horizontal, with the jaws equal anteriorly, and with the maxillary not extending backwards to the vertical from the front margin of the eye. Teeth in a band, those of the outer series being somewhat enlarged. Interorbital space very convex, twice as broad as the orbit; the eye is a little nearer to the extremity of the snout than to that of the opercle.

Vertical fins scaly at the base; the spinous dorsal is low, the length of the twelfth spine being one-third, or rather less than one-third, of that of the head. The soft dorsal and anal are somewhat produced, extending beyond the root of the caudal. The free portion of the tail is rather higher than long. Caudal subtruncated, its length being a little less than one-fifth of the total. Pectoral much shorter than the head, equal in length to the ventral, which does not extend on to the vent.

18. Heros coryphænoides.

Heros coryphænoides, *Heck. Brasil. Fluss-Fische*, p. 373.
—— niger, *Heck. l. c.* p. 375.

D. $\frac{16}{13-14}$. A. $\frac{6}{10-12}$. L. lat. 33.

The fold of the lower lip is interrupted in the middle; six series of scales on the cheek. The height of the body is a little less than one-third of the total length (with the caudal). Two black spots behind the eye, and sometimes a third on the opercle; a dark cross-bar below the twelfth and thirteenth dorsal spines.

Rio Negro.

19. Heros deppii.

Heckel, Brasil. Fluss-Fische, p. 382.

D. $\frac{17}{10}$. A. $\frac{6}{8}$. L. lat. 30. L. transv. 17.

The fold of the lower lip is interrupted in the middle; six series of scales on the cheek. The length of the head is contained once and a fourth in the greatest depth of the body, and thrice and three-fourths in the total length (with the caudal). The length of the dorsal spines is one-fourth of that of the head. Brownish; tail with six obsolete dark cross-bands, the last band with a black spot. (*Heck.*)

Mexico.

20. Heros montezuma.

Heckel, Brasil. Fluss-Fische, p. 383.

D. $\frac{16}{11}$. A. $\frac{5}{4}$*. L. lat. 30.

The fold of the lower lip is interrupted in the middle; five series of scales on the cheek. Body with six dark cross-bands, the last round the root of the caudal and marked with a black spot. (*Heck.*)

Mexico.

21. Heros godmanni.

D. $\frac{16\ 17}{13-12}$. A. $\frac{5}{9}$. L. lat. 33. L. transv. 5/13.

The fold of the lower lip is interrupted in the middle; seven series of scales on the cheek. The height of the body is contained twice and three-fourths in the total length (without caudal). Head greyish-olive; cheeks and body reddish-olive; an irregular blackish band proceeds from above the pectoral to a black spot in the middle of the root of the caudal. A black spot above the origin of the lateral band. Opercles, back, and vertical fins with black dots.

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* Is not this a misprint?

Guatemala.

a–b. Seven inches long. River of Cahabon. From the Collection of Messrs. Godman and Salvin.

Description.—The length of the head is contained thrice or thrice and a third in the total (without caudal). The profile of the nape is much curved. Head as high as long; snout rather elevated, the præorbital being wider than the orbit. Cleft of the mouth rather narrow, horizontal, with the jaws equal anteriorly, and with the maxillary not extending backwards to the vertical from the front margin of the eye. The six front teeth of the outer series are the longest, deep-brown. The nape is elevated, and the orbit considerably below the upper profile of the head. Opercles scaly.

Dorsal and anal fins very slightly scaly at the base; the spinous dorsal is low, the length of the twelfth spine being one-fourth of that of the head; the soft dorsal and anal are somewhat produced, extending beyond the root of the caudal. The free portion of the tail is somewhat higher than long. Caudal subtruncated, one-fifth of the total length. Pectoral shorter than the head, but rather longer than the ventral, which does not extend to the vent.

22. **Heros nebulifer.**

Chromis nebulifera, *Günth. Proc. Zool. Soc.* 1860, p. 318.

D. $\frac{18}{12}$. A. $\frac{6}{9}$. L. lat. 35. L. transv. 6/13.

The fold of the lower lip is interrupted in the middle; six series of scales on the cheek. The height of the body is contained twice and two-thirds in the total length (without caudal). Nearly uniform greenish-olive, with a black spot at the root of the caudal.

Mexico.

a–c. Types of the species. From M. Sallé's Collection.

Description.—The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head four times. The profile of the nape much curved. Head as high as long; snout slightly elevated, the præorbital being wider than the orbit. Cleft of the mouth small, horizontal, with the jaws equal anteriorly; interorbital space convex, its width being equal to one and a half diameter of the eye; opercles scaly.

Dorsal and anal fins very slightly scaly at the base; the spines of the former of moderate strength, the length of the twelfth being somewhat less than one-half of that of the head. The soft dorsal and anal are not produced, and the former does not extend to the root of the caudal. Caudal truncated. The free portion of the tail is longer than high. Pectoral shorter than the head; ventral not prolonged.

Greenish-olive: the middle of the body clouded with blackish, in the form of indistinct vertical bands; a round black spot in the middle of the root of the caudal; the outer parts of the fins blackish.

Length of the largest specimen 7 inches.

23. **Heros intermedius.**

D. $\frac{17-18}{11}$. A. $\frac{5-6}{10-8}$. L. lat. 32. L. transv. 5/13.

The fold of the lower lip is interrupted in the middle; five or six series of scales on the cheek. The height of the body is contained twice and three-fifths in the total length (without caudal). Brownish: lower parts red in adult specimens; a broad angular brown band on the trunk, its horizontal branch extending from the gill-opening to the vertical from the first anal spine, whilst its vertical branch ascends to the hinder dorsal spines. Each scale within this band with a black vertical streak. A rather narrow brown band runs from the angular band to a blackish spot at the root of the caudal. Vertical fins with whitish ocelli, enclosed by reddish streaks.

Guatemala.

a–c. From five to six inches long. From the Collection of Messrs. Salvin and Godman.

Description.—The length of the head is contained thrice and a fourth in the total (without caudal). The eye is not very remote from the profile of the nape, which is curved. Head as high as long; præorbital scarcely wider than the orbit. Cleft of the mouth rather narrow, horizontal, with the jaws equal anteriorly, and with the maxillary not extending backwards to the vertical from the front margin of the eye. The teeth in the outer series are the largest, and provided with brown tips. Opercles scaly.

Base of the soft dorsal and anal with scarcely any scales; dorsal spines of moderate length and strength, the length of the twelfth being one-third or nearly one-third of that of the head. The soft dorsal and anal extend slightly beyond the root of the caudal. The free portion of the tail is nearly as long as high. Caudal subtruncated, its length being one-fifth of the total. Pectoral shorter than the head, but rather longer than the ventral, which extends nearly to the vent.

This species is closely allied to *H. nebulifer* and *H. angulifer*, from which it may be distinguished by its colours and by the size of its scales.

24. **Heros angulifer.**

D. $\frac{17}{10}$. A. $\frac{5}{8}$. L. lat. 33. L. transv. 4/12.

The fold of the lower lip is interrupted in the middle; four series of scales on the cheek. The height of the body is two-fifths of the total length (without caudal). Brownish-olive, with a broad angular black band on the trunk, its horizontal branch extending from the eye to the vertical from the first anal spine, whilst its vertical branch ascends to the hinder dorsal spines. Some scales within the band

and on the opercles with a black dot. A round blackish blotch on the root of the caudal fin.

Guatemala.

a–b. Four inches long. River de Santa Isabel. From the Collection of Messrs. Godman and Salvin.

Description.—The length of the head is contained thrice and a third in the total (without caudal). The eye is not very remote from the profile of the nape, which is slightly curved. Head as high as long; præorbital scarcely wider than the orbit. Cleft of the mouth rather narrow, horizontal, with the jaws equal anteriorly, and with the maxillary not extending backwards to the vertical from the front margin of the eye. The teeth in the outer series are the largest, and provided with brown tips. Opercles scaly.

Dorsal and anal fins not scaly; dorsal spines of moderate length and strength, the length of the twelfth being one-third of that of the head; the soft dorsal and anal extend to the root of the caudal. The free portion of the tail is as long as high. Caudal subtruncated, its length being not quite one-fifth of the total. Pectoral shorter than the head, but longer than the ventral, which does not extend to the vent.

25. **Heros oblongus.**

Chromys oblonga, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 14.

D. $\frac{15}{8}$. A. $\frac{7}{7}$.

The height of the body is a little less than one-third of the total length. (*Cast.*)

Tocantins (Province of Goyaz).

26. **Heros autochthon.**

B. 5. D. $\frac{16}{10}$. A. $\frac{7}{8}$. L. lat. 25. L. transv. 4/8.

Scales on the cheek in two or three series. Body with dark cross-bands. The width of the interorbital space is more than that of the orbit.

Brazil.

a, b, c, d. Presented by Lord Stuart.

Description.—The height of the body is one-half of the total length (without caudal), the length of the head a little more than one-third. The upper profile is strongly curved on the nape, concave before the eyes, and straight on the snout. Head as high as long; snout of moderate extent, with the cleft of the mouth oblique and with the jaws equal anteriorly. Jaws moderately protractile; the maxillary does not extend to the vertical from the anterior margin of the orbit. Præorbital square, rather narrower than the orbit. The width of the interorbital space equals the extent of the snout, and is more than the diameter of the eye, which is one-fourth of the length of the head. The eye is situated a little nearer to the extremity of the snout than to that of the operculum, immediately below the upper profile of the head. Scales on the cheek of moderate size, in three curved series—in one specimen in two. Scales on the opercles large.

The dorsal commences vertically above the extremity of the operculum and terminates so close to the caudal, that the distance between the two fins is only one-half of the depth of the free portion of the tail. The spines are rather slender and increase posteriorly in length, the length of the twelfth being less than one-half of that of the head. The middle of the soft dorsal and anal are prolonged into a filament, extending to the end of the caudal. The soft portions of the vertical fins have a slight scaly covering at the base. Anal spines similar to those of the dorsal fin in length and strength. Caudal rounded. Pectoral as long as the head; ventral spine of moderate size, the two outer soft rays produced into filaments. The distance between the vent and the root of the ventrals equals one-half of the length of the head. Root of the ventrals immediately behind that of the pectorals.

Scales ctenoid; one of the largest covers two-thirds of the eye.

The teeth in the jaws are small, cardiform, forming a band, those of the outer series being enlarged; the pharyngeal plate is a little broader than long, armed with similar teeth, except that those on the middle posteriorly are broader, molar-like.

The colours have apparently faded. The ground-colour is a reddish-olive; six or seven dark bands traverse the body and tail, that descending from the thirteenth dorsal spine being the darkest; a blackish spot at the root of the caudal.

Length of the largest specimen 5½ inches.

8. MESONAUTA.

Heros, sp., *Heckel.*

Body compressed, rather elevated behind, covered with ctenoid scales of moderate size. Dorsal spines numerous, anal spines eight to nine; base of the soft dorsal scaly. Teeth in a band, small, conical. Anterior prominences of the first branchial arch short horny processes. Cleft of the mouth small. Scales on the cheek of moderate size, in three series. The origin of the ventral falls vertically a little before that of the dorsal.

Brazil.

1. Mesonauta insignis.

Heros insignis, *Heckel, Brasil. Fluss-Fische,* p. 378.
—— festivus, *Heck. l. c.* p. 376.
Chromys (?) acora, *Casteln. Anim. nouv. Poiss.* p. 17. pl. 9. fig. 1 (bad).

D. $\frac{15-16}{11-10}$. A. $\frac{8-9}{11-12}$. L. lat. 27. L. transv. 4/11.

The fold of the lower lip interrupted in the middle; three series of scales on the cheek. The height of the body is a little more than one-half of the total length (without caudal). An oblique, straight black band runs from the eye to the top of the soft dorsal. A black ocellus, edged with white, on the upper part of the root of the caudal.

Rio Negro, Guaporé, Araguay.

a. Fine specimen. From the Collection of the Zoological Society.
b. Adult: skin. Tropical America.

9. PETENIA.

Body compressed, oblong, covered with ctenoid scales of moderate size. Dorsal spines numerous, anal spines more than four; the soft dorsal scaleless. Teeth in a band, small, conical. Anterior prominences of the first branchial arch short, compressed, distant. Cleft of the mouth wide; jaws very protractile. Scales on the cheeks small. The origin of the ventral falls vertically below that of the dorsal.

Guatemala.

1. Petenia splendida.

B. 5. D. $\frac{15}{12}$. A. $\frac{5}{10}$. L. lat. 41. L. transv. 6/17.

Scales on the cheek in about seven series. Greenish, shining golden; head, body, and vertical fins with black dots. A series of six or seven large round black spots along the middle of the side, the last spot being edged with white, and situated on the upper half of the root of the caudal.

Lake Peten.

a–c. Fine specimens. From the Collection of Messrs. Salvin and Godman.

Description.—The height of the body is contained thrice in the total length (without caudal), the length of the head twice and two-thirds. Head longer than high; snout compressed, triangular, with the lower jaw very prominent. The jaws are extremely protractile, so that the snout is not much shorter than the head when the jaws are protracted. The processes of the intermaxillaries extend backwards to the nape of the neck, and the length of the mandibles is three-quarters of that of the head. The greater portion of the maxillary is not covered by the præorbital, and it extends beyond the vertical from the centre of the orbit. Each jaw is armed with a band of villiform teeth, the outer series containing rather larger conical teeth. Præorbital narrower than the orbit, the diameter of which is one-sixth or one-seventh of the length of the head. Interorbital space very convex, as wide as, or wider than, the orbit.

The gill-membranes are united below the throat, and not attached to the isthmus. The first branchial arch has thirteen anterior prominences.

The dorsal fin commences in the vertical from the root of the pectoral; its spines are of moderate length and strength; they increase in length to the seventh, the length of which is two-ninths of that of the head; the posterior spines, again, are a little longer than the middle ones. The soft dorsal and anal are rather elevated, extending to, or nearly to, the root of the caudal. The anal spines are strong, two-sevenths of the length of the head. Caudal rounded, its length being rather more than one-sixth of the total. The free portion of the tail is longer than high. The pectoral extends to the first anal spine, the ventral to the vent. The distance of the vent from the ventral is nearly one-half of the length of the head.

Length of the largest specimen 16 inches.

10. UARU.

Uaru, *Heckel, Brasil. Fluss-Fische, in Ann. Wien. Mus.* ii. p. 330.

Body compressed, elevated, covered with small ctenoid scales. Dorsal spines numerous, anal spines eight. Base of the soft dorsal scaly. Teeth awl-shaped, forming a series separate from the small teeth behind. Anterior prominences of the first branchial arch short horny bi- or tri-cuspid processes. Cleft of the mouth oblique, of moderate width, and with the jaws equal anteriorly. Scales on the cheek small, in numerous series.

Brazil.

1. Uaru amphiacanthoides.

Heckel, Brasil. Fluss-Fische, p. 331.

D. $\frac{16}{14}$. A. $\frac{8}{14}$. L. lat. 42. L. transv. 11/?.

Scales on the cheek in ten or eleven series. Light-brown: a large elliptical or band-like spot extends from the root of the pectoral to that of the caudal; a black spot at the root of the caudal, another at the base of the pectoral, and a third behind the eye. (*Heck.*)

Rio Negro.

2. Uaru obscurum.

D. $\frac{16}{15}$. A. $\frac{8}{14}$. L. lat. 50. L. transv. 13/26.

Scales on the cheek in nine subhorizontal series. Blackish-brown; a black spot at the root of the caudal.

River Cupai.

a. Six inches long. Eight hundred miles from the sea. Purchased of Mr. Stevens.

Description of the specimen.—The height of the body is two-thirds of the total length (the caudal not included), the length of the head nearly one-third. Head higher than long, with the upper profile very oblique. Snout compressed, elevated, much longer than the eye, with the jaws equal anteriorly and with the cleft of the mouth oblique. The maxillary does not extend to below the anterior margin of the eye. The front teeth of the jaws are rather long and slender, of moderate strength, awl-shaped, with brown points; they form a single closely-set series, there being ten on each side of the upper jaw, and eight on each side of the lower; there is another single series of smaller teeth behind the front series of the upper jaw, whilst the hind teeth in the lower jaw form a narrow band. The jaws are scarcely protractile.

The space between the orbits is convex, much wider than the orbit, and as wide as the præorbital. The eye is nearer to the extremity of the operculum than to that of the snout; its diameter is contained four times in the length of the head and once and a half in the extent of the snout. Cheek covered with small scales, arranged in nine subhorizontal and in eight subvertical series. Operculum and suboperculum entirely scaly.

Dorsal spines very strong: the seventh and eighth are the longest, their length being somewhat more than one-half of that of the head; the posterior spines are a little shorter; the soft dorsal is somewhat elevated in the middle and scaly at the base; the distance of the dorsal from the caudal is only one-half of the depth of the free portion of the tail Anal spines shorter but rather stronger than those of the dorsal fin. Pectoral as long as the head; the outer ventral ray prolonged into a short filament.

Scales ctenoid; those of the lateral line are larger than the others, with the single tubes much elongate.

Nearly uniform blackish-brown: a black spot on the upper half of the root of the caudal; a small black spot behind the eye.

11. HYGROGONUS.

Acara, sp., *Heckel.*

Body compressed, oblong, covered with scales of moderate size, which are very slightly crenulated posteriorly. Dorsal spines numerous, anal spines three. Vertical fins enveloped in a coat of scales. Teeth in a band, conical. Anterior prominences of the first branchial arch short, tubercle-like. Cleft of the mouth of moderate width, oblique, extending to below the eye, with the lower jaw longest. Scales on the cheek small.

Brazil.

1. Hygrogonus ocellatus.

Lobotes ocellatus, *Agass. in Spix, Pisc. Brasil.* p. 129. tab. 68.
Acara crassipinnis, *Heckel, Brasil. Fluss-Fische,* p. 356.

D. $\frac{13}{20}$. A. $\frac{3}{15}$. L. lat. 37–38.

Scales on the cheek in about ten series; præorbital half as wide as the eye. A black ocellus at the root of the caudal.

Brazil.

The specimen described by Agassiz has an ocellus on the root of the pectoral, and several others along the base of the dorsal.

12. CICHLA.

Cichla, pt., *Cuv. Règne Anim.*
Cichla, *Heck. Brasil. Fluss-Fische, in Ann. Wien. Mus.* 1840, ii. p. 408.

Habit Perch-like. Scales small. The spinous and soft portions of the dorsal of nearly equal extent, and separated by a notch; anal spines three. Each jaw with a broad band of villiform teeth. The outer branchial arch with lanceolate crenulated prominences along its concave side. Dorsal and anal fins scaly.

Brazil and Guiana. (Peru.)

The following *osteological* notes are taken from a specimen in the Berlin Anatomical Museum, 2½ feet long, procured by Schomburgk in Guiana, and named *C. monoculus*, but with nineteen spines in the dorsal fin:—A strong crest on the head, bifid anteriorly where it belongs to the frontal bones, whilst its posterior part is formed by a portion of the occipital; there are two other ridges on the side of the crest. The frontal projects very strongly above the orbit, forming a convex roof. Præorbital large, thick, divided into two by a suture; the upper piece is the larger, thick, joined to the præfrontal, and covering the maxillary; the lower is narrow, triangular, pointing towards the infraorbital ring, which is narrow and composed of five bones. The dentary has posteriorly a process which forms an acute angle with the articulary; the latter with a process directed posteriorly forwards; these two processes nearly touch each other. Os basilare with an acute ridge. Eighteen abdominal and as many caudal vertebræ; eighteen ribs, some of the middle with epipleurals.

1. Cichla ocellaris.

Cichla ocellaris, *Bl. Schn.* p. 340. tab. 66; *Müll. & Trosch. in Schomb. Guyana*, iii. p. 625.
—— monoculus, *Agass. in Spix, Pisc. Bras.* p. 100. tab. 63 & tab. E; *Heck. Brasil. Fluss-Fische*, p. 411.
—— atabapensis, *Humb. Observ. Zool.* ii. p. 168.

D. 14 $\Big|\,\frac{1}{16}$. A. $\frac{3}{11}$. L. lat. 88.

Ten series of scales between the origin of the dorsal fin and the lateral line. Caudal rounded. The height of the body is one-fourth of the total length. Back with three black cross-bars; a black ocellus on the root of the caudal; (a series of black spots on the side of the belly, beginning in the axil of the pectoral;) no longitudinal band on the head.

Fresh waters of Brazil and Surinam.

a, b. Adult and half-grown. Guiana. Presented by Sir R. Schomburgk.
c. Adult: stuffed. Demerara. From the Collection of the Zoological Society.
d, e. Half-grown and young.

Cycla toucounarai, Casteln. Anim. nouv. ou rares Amér. Sud, Poiss. p. 17. pl. 10. fig. 1, is probably identical with this species, but has no black spots on the side of the belly.

2. Cichla temensis.

Cichla temensis, *Humb. Observ. Zool.* ii. p. 169; *Heck. Brasil. Fluss-Fische*, p. 413.
—— tucunare, *Heck. l. c.* p. 409.

D. 14 $\Big|\,\frac{1}{16\text{-}17}$. A. $\frac{3}{9}$. L. lat. 110.

Thirteen series of scales between the origin of the dorsal fin and the lateral line. Caudal fin truncated or slightly emarginate. The height of the body is one-fourth of the total length. Body with three blackish vertical bands; a black ocellus on the root of the caudal; sides of the belly without spots. A dark band runs from the snout, through the eye, to the angle of the operculum, and is formed by a series of spots on the opercle of old individuals. Immature specimens with series of white spots on the body, on the soft dorsal and caudal.

Fresh waters of Brazil.

a, b, c. Fine adult and half-grown specimens. River Cupai. Purchased of Mr. Stevens.

3. Cichla multifasciata.

Casteln. Anim. nouv. ou rares Amér. Sud, Poiss. p. 18. pl. 10. fig. 2.

Sixteen dorsal spines; (scales of moderate size?;) caudal rounded. The height of the body is nearly one-fifth of the total length. Body with eleven oblique black cross-bands; a black ocellus on the root of the caudal. (*Cast.*)

Ucayale (Peru).

4. Cichla conibos.

Casteln. l. c. fig. 3.

Fourteen dorsal spines; (scales of moderate size?;) caudal forked. The height of the body is one-fifth of the total length. Body with seven oblique black cross-bands; a black ocellus on the root of the caudal. (*Cast.*)

Ucayale (Peru).

13. CRENICICHLA.

Crenicichla, *Heckel, Brasil. Fluss-Fische, in Ann. Wien. Mus.* 1840, ii. p. 416.

Batrachops, *Heckel, l. c.* p. 432.

Body depressed, low, subcylindrical; scales small or rather small. The spinous portion of the dorsal is considerably more developed than the soft, both continuous, not separated by a notch; anal spines three. Præoperculum generally minutely serrated. Each jaw with a band of conical teeth, those of the outer series being sometimes enlarged and separated from the others by an interspace. The outer branchial arch with short, bony, tubercle-like prominences. Dorsal and anal fins naked.

Brazils. Guiana.

1. Crenicichla obtusirostris.

D. $\frac{22}{17}$. A. $\frac{3}{11}$. L. lat. 130.

Fifteen series of scales between the origin of the dorsal fin and the lateral line. Snout broad, depressed, obtuse, its length being equal to the width of the interorbital space. The height of the body is two-elevenths of the total length, the length of the head one-fourth.

Brazil.

a. Thirteen inches long. River Capin. Purchased of Mr. Stevens.

This species very much resembles *Cr. johanna*, but the snout is comparatively very short, one-third of the length of the head. The cleft of the mouth is much broader than long, and the inner margins of the mandibles and interopercles do not touch each other in the median line. There is a compressed, cutting, scaly, cartilaginous excrescence, like an adipose fin, on the back of the tail, near the base of the caudal. We cannot say whether this is merely accidental, or a specific character. The specimen is uniform brown.

2. Crenicichla johanna.

? Nhaquunda, *Marcgr.* p. 171.
? Perca brasiliensis, *Bl.* vi. p. 84. tab. 310 fig. 2.
Cichla brasiliensis, *Bl. Schn.* p. 339.
Crenicichla vittata, *Heck. Brasil. Fluss-Fische*, p. 417.
—— lenticulata, *Heck. ibid.* p. 419.
—— adspersa, *Heck. ibid.* p. 421.
—— lugubris, *Heck. ibid.* p. 422.
—— funebris, *Heck. ibid.* p. 424.
—— johanna, *Heck. ibid.* p. 425.

D. $\frac{21-23}{14-17}$. A. $\frac{3}{9-12}$. L. lat. 100–120.

About fifteen series of scales between the origin of the dorsal fin and the lateral line. Snout moderately produced, its length being somewhat more than the width of the interorbital space. The height of the body is one-fifth of the total length, the length of the head two-sevenths.

Var. *α. vittata*. A black band runs from the snout, through the caudal spot, to the extremity of the caudal; a black vertical spot below the eye; upper parts of the head with blackish dots and streaks.

a. Half-grown. From the Collection of the College of Surgeons.

Var. *β. strigata*. A pair of brown streaks along the middle of the body to the caudal spot, the upper streak continued on through the eye to the snout. Another streak along the upper portion of the lateral line; an undulated brown band along the back. Upper part of the head with series of round black spots and with a longitudinal streak, which is forked posteriorly. Vertical fins with broad black marginal bands.

b, c–e. Adult. River Capin. Purchased of Mr. Stevens.

f. Half-grown. River Cupai (800 miles from the sea). Purchased of Mr. Stevens.

Var. *γ. lenticulata*. A band, formed by eight or nine irregular blotches, along the upper part of the body; head superiorly and thoracic region with round spots; margin of the dorsal black.—Rio Negro.

Var. δ. *adspersa*. Greenish-brown; an ocellus on the base of the caudal; the whole head and thoracic region with black dots.—Rio Guaporé.

Var. ϵ. *lugubris*. Uniform, with an obsolete dark blotch on the scapulary region, and with a deep-black spot in the middle of the base of the caudal.—Rio Negro.

Var. ζ. *funebris*. Uniform, with a dark blotch on the scapulary region; caudal spot indistinct.

g. Fine specimen. River Capin. Purchased of Mr. Stevens.
h,i. Adult and half-grown. Guiana. Presented by Sir R. Schomburgk.

Var. η. *johanna*. Uniform brown or black.

k. Adult. From the Collection of the Zoological Society.
l. Half-grown. River Cupai. Purchased of Mr. Stevens.

In a specimen in the Berlin Anatomical Museum, the intestines make only one complete circumvolution and several curvatures; the right ovarium of that specimen is twice the size of the left, extending, however, only to the middle of the length of the abdomen. Air-bladder simple, large, with thick membranes.

3. Crenicichla acutirostris.

D. $\frac{24}{14}$. A. $\frac{3}{11}$. L. lat. 125.

Thirteen series of scales between the origin of the dorsal fin and the lateral line. Snout produced, its length being once and a half the width of the interorbital space. The height of the body is two-fifteenths of the total length, the length of the head one-fourth.

River Cupai.

a. Nine inches long. River Cupai (800 miles from the sea). Purchased of Mr. Stevens.

This species resembles *Cr. johanna*, but its snout is comparatively much more produced, its length being contained twice and three-fifths in that of the head. The cleft of the mouth is somewhat less broad than long, and the inner margins of the mandibles are in immediate contact with each other. The specimen is brown, with a series of ten square lighter spots on the back, along the base of the dorsal fin.

4. Crenicichla macrophthalma.

Heckel, Brasil. Fluss-Fische, p. 427.

D. $\frac{22}{10-11}$. A. $\frac{3}{7-8}$. L. lat. 68–70.

The diameter of the eye is one-fourth of the length of the head. The height of the body is contained five times and a fourth in the total length, the length of the head three times and a half. A black spot at the root of the caudal fin; an indistinct dark streak from the eye to the angle of the operculum. Scales of the lateral line white, with black margins. (*Heck.*)

Rio Negro.

Described from a specimen 9 inches long.

5. **Crenicichla saxatilis.**

Sciæna, *L. Mus. Ad. Fried.* p. 65. tab. 31. fig. 1.
Sparus saxatilis, *L. Syst.* i. p. 468.
Sparus, sp., *Gronov. Mus. Ichth.* ii. p. 29. tab. 6. fig. 3.
Scarus, *Gronov. Zoophyl.* p. 67.
Perca saxatilis, *Bl.* taf. 309.
Cichla labrina, *Agass. in Spix, Pisc. Bras.* p. 99. tab. 62. fig. 1.
Crenicichla saxatilis, *Heck. Brasil. Fluss-Fische*, p. 432.
—— lepidota, *Heck. l. c.* p. 429.
Scarus pavoninus, *Gronov. Syst. ed. Gray*, p. 63.

D. $\frac{18}{14}$. A. $\frac{3}{9}$. L. lat. 54. L. transv. 7/14.

Snout moderately produced, its length being equal to the width of the interorbital space. The height of the body is contained four times and two-thirds in the total length, the length of the head three times and three-fourths. A black ocellus at the root of the caudal; a brown blotch behind the shoulder, connected with the eye by a brown band; a brown spot below the orbit. Young specimens have sometimes a brown longitudinal band from the snout to the caudal fin.

Brazil. Guiana.

a. Half-grown. River Cupai (800 miles from the sea). Purchased of Mr. Stevens.
b. Young. River Capin. Purchased of Mr. Stevens.
c, d, e. Half-grown. Demerara. Presented by Dr. Hancock.
f–g. Half-grown. British Guiana. Presented by Sir R. Schomburgk.
h, i. Adult. Dutch Guiana. Purchased of Mr. Frank.
k. Half-grown: skin. From Gronow's Collection.

Variety: a series of black blotches along the lateral line.

a. Fine specimen. West Indies? Purchased of Mr. Scrivener.

Crenicichla frenata (Gill, Freshw. Fish. Trinidad, in Ann. Lyc. Nat. Hist. New York, vi. 1858) is very closely allied to this species.

6. **Crenicichla lacustris.**

Cycla lacustris, *Casteln. Anim. nouv. ou rares Amér. Sud, Poiss.* p. 19. pl. 8. fig. 3.

D. $\frac{18}{13}$. A. $\frac{3}{9}$.

Scales not very small. Snout moderately produced. The height of the body is one-sixth of the total length. A black spot at the root of the caudal; another on the middle of the spinous dorsal; body brownish, dotted with black. (*Cast.*)

Bahia.

7. Crenicichla orinocensis.

Cichla orinocensis, *Humboldt, Observ. Zool.* ii. p. 167. pl. 45. fig. 3.
—— argus, *Valenc. ibid.* p. 169.

D. $\frac{18}{13}$. A. $\frac{3}{9}$.

Greenish, dotted with black; a series of four large black ocelli, edged with yellow, along the side.

Rio Negro, Orinoco.

8. Crenicichla reticulata.

Batrachops reticulatus, *Heck. Brasil. Fluss-Fische,* p. 433.

D. $\frac{24}{11}$. A. $\frac{3}{8}$. L. lat. 66.

The diameter of the eye is one-fifth of the length of the head. The height of the body is one-sixth of the total length, the length of the head two-sevenths. Jaws with a front series of rather strong conical teeth. A black ocellus on the upper part of the root of the caudal. Each scale brown at the base, with yellowish margin. A dark band from the eye to the extremity of the operculum. Dorsal and anal with series of blackish dots. (*Heck.*)

Rio Negro.

Described from a specimen 10 inches long.

9. Crenicichla semifasciata.

Batrachops semifasciatus, *Heck. Brasil. Fluss-Fische,* p. 436.

D. $\frac{22-23}{10-9}$. A. $\frac{3}{6-7}$. L. lat. 56–57.

The diameter of the eye is a little less than one-fifth of the length of the head. The height of the body is one-fifth of the total length, the length of the head two-sevenths. Jaws with a front series of rather strong conical teeth. A black ocellus on the upper part of the caudal fin, near the base. Each scale yellowish at the base, with brown margin. A dark band from the eye to the extremity of the operculum; back with dark cross-bands. Vertical fins immaculate.

Province of Matogrosso. Rio Paraguay.

A specimen in the Berlin Museum appears to indicate the identity of this and the preceding species.

14. CHÆTOBRANCHUS.

Chætobranchus, *Heck. Bras. Fluss-Fische, in Ann. Wien. Mus.* ii. 1840, p. 401.

Body compressed, oblong, covered with scales of moderate size. Dorsal spines numerous, anal spines three; base of the soft dorsal fin not scaly. Each jaw with a front series of small awl-shaped teeth, behind which is another series of smaller teeth. Cleft of the mouth of moderate width. The outer branchial arch is provided anteriorly with long, setiform, closely-set prominences. Scales on the cheek in five or more series.

Brazil and Guiana.

1. Chætobranchus flavescens.

Heckel, l. c. p. 402.

D. $\frac{13}{13}$. A. $\frac{3}{11}$. L. lat. 26.

The height of the body is one-half of the total length (without caudal); the maxillary extends to below the anterior margin of the eye. Scales on the cheek arranged in six series. The length of the dorsal spines behind the fourth is only two-sevenths of that of the head. A black lateral spot; two bluish convergent stripes from the mouth to the eye; vertical fins with transverse or oblique streaks (*Heck.*)

Rio Negro. Rio Guaporé.

2. Chætobranchus brunneus.

Heckel, l. c. p. 405.

D. $\frac{13}{12}$. A. $\frac{3}{11}$. L. lat. 26.

The height of the body is three-eighths of the total length (without caudal); the maxillary does not extend to the vertical from the anterior margin of the eye. Scales on the cheek arranged in five series. The length of the dorsal spines behind the fourth, is one-third of that of the head. A black lateral spot; two bluish parallel lines from the mouth to the eye; vertical fins with transverse or oblique streaks. (*Heck.*)

Rio Negro.

3. Chætobranchus robustus.

D. $\frac{13}{13}$. A. $\frac{3}{11}$. L. lat. 25. L. transv. $\frac{3\frac{1}{2}}{11}$. Vert. 13/13.

The height of the body is four-ninths of the total length (the caudal not included); the maxillary does not extend to the vertical from the anterior margin of the eye. Scales on the cheek arranged in five series. The length of the twelfth dorsal spine is contained twice and a third in that of the head.

Guiana.

a. Eleven inches long. Guiana. Presented by Sir R. Schomburgk.

Description.—The greatest depth of the body is below the sixth dorsal spine, and four-ninths of the total length (without caudal), the length of the head nearly one-third. The width of the interorbital space is not quite twice the diameter of the eye, and two-fifths of the length of the head. The free portion of the tail is half as high, and one-third as long, as the length of the head. Snout broad, obtusely conical, its length being once and a half the diameter of the eye; præorbital as wide as the orbit. Cleft of the mouth oblique, with the lower jaw slightly prominent; the free margin of the lower lip is not interrupted in the middle; maxillary not extending to the vertical from the anterior margin of the eye. The scales on the cheek are much smaller than those of the body, rather irregularly arranged in five series.

Spines of the fins very stout, gradually increasing in length posteriorly; the soft parts of the vertical fins produced. Pectoral longer than the head, extending to the middle of the anal; the outer ventral ray, which is produced into a filament, reaches as far backwards as the pectoral.

Yellowish-olive, shining golden, with a large black blotch on the middle of the sides; snout with two parallel bluish streaks: one across the præorbital, the other along the lower margin of the præorbital and the orbit. Vertical fins with blackish streaks.

I would observe, from notes made at Berlin several years ago, that a specimen in the Collection of the Anatomical Museum, $1\frac{1}{3}$ feet long, also brought by Schomburgk from Guiana, and named *Ch. flavescens*, belongs to this species. The following notes are from a skeleton in the same Collection:—

Crown of the head with a high crest, commencing on the frontal bones; its formation by two lamellæ is very conspicuous anteriorly where the long processes of the intermaxillaries are received between them. There are several foramina of the muciferous channels on the præfrontals where they join the principal frontals; the largest of these channels is continued into the tubiform turbinal. The frontal projects very strongly above the orbit, forming a convex roof. There are two other ridges on the side of the occipital crest. The præorbital large; four other infraorbitals form an equally feeble and narrow orbital ring. The dentary has posteriorly a long and broad process which is nearly rectangular to the articulary; the latter with a process directed forwards posteriorly: these two processes are remote from each other, but united by a ligament. Os basilare with a broad, sharp, lamelliform ridge.—Thirteen abdominal and as many caudal vertebræ; ten ribs.

15. MESOPS.

Geophagus, sp., *Heckel.*

Body compressed, oblong, covered with scales of moderate or rather large size; eye in, or in advance of, the middle of the length of the head; præorbital not elevated. Dorsal spines numerous, anal spines three; base of the soft dorsal naked. Structure of the branchial arches as in *Geophagus*. Cleft of the mouth small; teeth in a band, small.

Brazil.

1. Mesops cupido.

Geophagus cupido, *Heckel, Brasil. Fluss-Fische*, p. 399.

D. $\frac{15}{10}$. A. $\frac{3}{9}$. L. lat. 32.

Fold of the lower lip continuous in the middle. Cleft of the mouth small; præorbital as wide as the orbit. Scales on the cheek in four or five series; caudal emarginate. A black lateral spot; a dark band descends from the occiput, through the eye, to the angle of the præoperculum. Fins uniform. (*Heck.*)

Rio Negro. Rio Guaporé.

2. Mesops tæniatus.

D. $\frac{15}{6}$. A. $\frac{3}{6}$. L. lat. 23. L. transv. 9.

Fold of the lower lip continuous in the middle. Præorbital much narrower than the orbit. Scales on the cheek in three series.

River Cupai.

a. Twenty-seven lines long. River Cupai (800 miles from the sea). From Mr. Bates's Collection.

Description of the specimen.—The height of the body equals the length of the head, and is one-third of the total. Head longer than high; snout short, obtuse, as long as the eye, the diameter of which is two-sevenths of the length of the head and equals the width of the interorbital space. Cleft of the mouth oblique, with the lower jaw slightly prominent, and with the maxillary extending to below the front margin of the eye. Præorbital much narrower than the orbit; eye situated in the anterior half of the length of the head, immediately below the upper profile. Dorsal spines slender, the length of the twelfth being nearly two-thirds of that of the head. The soft dorsal and anal extend to the middle of the caudal, if laid backwards. Caudal rounded. The pectoral and ventral reach beyond the origin of the anal.

Brownish, with a black band running along the middle of the side and terminating in a black caudal spot; an oblique black band from the eye to the angle of the præ- and inter-operculum; a short black streak in front of the eye.

16. SATANOPERCA.

Geophagus, sp., *Heckel.*

Body compressed, oblong, covered with ctenoid scales of moderate size; eye more remote from the extremity of the snout than from that of the opercle; præorbital elevated. Dorsal spines numerous, anal spines three; base of the soft dorsal naked. Structure of the branchial arches as in *Geophagus.* Cleft of the mouth of moderate width; teeth in a narrow band, very small. Scales on the cheek small, in more than five series.

Brazil (Peru).

1. Satanoperca acuticeps.

Geophagus acuticeps, *Heckel, Brasil. Fluss-Fische,* p. 394.

D. $\frac{13}{11}$. A. $\frac{3}{7}$. L. lat. 27. L. transv. $\frac{4\frac{1}{2}}{10}$.

Fold of the lower lip continuous in the middle. The greater portion of the eye is situated in the posterior half of the head. Scales on the cheek small, in six or seven series; greater part of the operculum naked. The spinous dorsal elevated, the length of the middle and posterior spines being two-thirds of that of the head; caudal scaly superiorly and inferiorly, naked in the middle. A blackish spot at the root of the caudal.

Barra do Rio Negro. River Cupai.

a, b, c. River Cupai. Purchased of Mr. Stevens.

2. Satanoperca pappaterra.

Geophagus pappaterra, *Heckel, l. c.* p. 396.

D. $\frac{15}{10}$. A. $\frac{3}{7}$. L. lat. 32.

Fold of the lower lip continuous in the middle. Scales on the cheek in six series; operculum scaly. A portion of the upper and lower margins of the caudal covered with small scales. A black band commences at the gill-opening, and is continued on over the upper half of the caudal fin; two blackish bands across the nape; fins immaculate. (*Heck.*)

Rio Guaporé.

3. Satanoperca dæmon.

Geophagus dæmon, *Heckel, l. c.* p. 389.

D. $\frac{14}{11}$. A. $\frac{3}{8}$. L. lat. 33.

The fold of the lower lip is interrupted in the middle. Scales on the cheek in eight series; operculum scaly. The dorsal spines become gradually longer posteriorly; the upper and lower margins of the caudal are a little scaly. A blackish spot in the middle of the upper lateral line, another at its end; a large ocellus at the base of the caudal; a black streak from the upper lip to the angle of the præoperculum; three black cross-bands between the eyes. Dorsal with oblique yellowish and blackish stripes. (*Heck.*)

Rio Negro.

Size of a River-Perch.

4. Satanoperca jurupari.

Geophagus jurupari, *Heckel, l. c.* p. 392.

D. $\frac{15}{10}$. A. $\frac{3}{7}$. L. lat. 30.

The fold of the lower lip is interrupted in the middle. Scales on the cheek in six series; operculum scaly. Dorsal spines equal in height. The upper and lower margins of the caudal are a little scaly. A small black spot superiorly at the root of the caudal; a black streak from the upper lip to the angle of the præoperculum; three brownish cross-bands between the eyes. Dorsal fin with white spots posteriorly at the base. (*Heck.*)

Rio Negro. Amazon River.

5. Satanoperca macrolepis.

D. $\frac{15}{10}$. A. $\frac{3}{7}$. L. lat. 27. L. transv. $\frac{3\frac{1}{2}}{8}$.

The fold of the lower lip is interrupted in the middle. Scales on the cheek in six or seven series; one-half of the operculum is naked. Head with reticulated lines.

Demerara.

a. Eight inches long: stuffed. Demerara. From the Collection of the Zoological Society.

b. Half-grown: not good state. British Guiana. Presented by Sir R. Schomburgk.

c. Half-grown: stuffed.

Description.—The height of the body is nearly two-fifths of the total length (without caudal), the length of the head one-third. The head is as high as long, and the width of the interorbital space two-sevenths of its length. The snout is compressed, elevated, and so much produced that the eye is situated entirely in the posterior half of the length of the head; præorbital twice as wide as the eye. Cleft of the mouth of moderate width, the jaws being armed with a very narrow band of extremely small teeth. Eye situated near the upper profile, the space between the orbits being convex. Only the upper portion of the narrow operculum is scaly.

Dorsal and anal fins entirely naked. Dorsal spines long and strong, the length of the middle and posterior ones being one-half of that of the head; the soft portion is somewhat more elevated. The third anal spine is stronger, but not longer, than the fourth of the dorsal fin. Caudal rounded, scaly at the base and on a portion of its upper and lower margins. Pectoral and ventral of moderate length.

The colours have apparently much faded: body and fins of a uniform yellowish-olive; the head is covered with a network of brownish lines, each mesh including a light spot half the size of a scale. A small dark spot on the upper part of the root of the pectoral.

6. Satanoperca proxima.

Chromys proxima, *Casteln. Anim. nouv. Amér. Sud, Poiss.* p. 14. pl. 7. fig. 1.

D. $\frac{16}{12}$. A. $\frac{3}{7}$.

The height of the body is contained twice and a fourth in the total length (without caudal). Pectoral exceedingly long, much longer than the head. Body with a large black lateral blotch. (*Cast.*)

Ucayale (Peru).

7. Satanoperca (?) leucosticta.

Geophagus leucostictus, *Müll. & Trosch. in Schomb. Guiana*, iii. p. 625.

D. $\frac{16}{8}$. A. $\frac{3}{6}$.

Sides of the head with numerous small white dots; several others on the shoulder; a single series of white spots immediately below the base of the dorsal; caudal and dorsal fins spotted with white.

Lake Amucu.

17. GEOPHAGUS.

Geophagus, sp., *Heckel, Brasil. Fluss-Fische, in Ann. Wien. Mus.* ii. 1840, p. 383.

Body compressed, oblong, covered with ctenoid scales of moderate size. Dorsal spines numerous, anal spines three; base of the soft dorsal scaly. Teeth in a narrow band, small, conical. The outer branchial arch is provided with a compressed lamelliform lobe at its upper extremity; its concave side is provided with short horny processes, the edge of the lobe with more or less distinct papillæ. Cleft of the mouth of moderate width. Scales on the cheek small, in more than five series.

Brazil and Guiana.

1. Geophagus surinamensis.

Sparus surinamensis, *Bl.* taf. 277. fig. 2.
Geophagus megasema, *Heckel, Brasil. Fluss-Fische,* p. 388.
—— altifrons, *Heckel, l. c.* p. 385.
—— surinamensis, *Müll. & Trosch. in Schomb. Guiana,* iii. p. 625.

D. $\frac{17-19}{10-12}$. A. $\frac{3}{8}$. L. lat. 35. L. transv. 6/12.

The eye is situated in the posterior half of the head; snout elevated, the præorbital being twice as wide as the orbit. Fold of the lower lip interrupted in the middle. Scales on the cheek small, arranged in six or seven subvertical series. The ninth dorsal spine is not quite half as long as the head. Caudal fin enveloped in small scales, except in the middle, which is naked; the outer ventral ray produced into a long and thick filament. The greatest depth of the body is below the origin of the dorsal fin, and one-third of the total length, the length of the head one-fourth. Yellowish (in spirits), with a large black blotch on the side; dorsal and anal fins and the scaly portion of the caudal with brown longitudinal streaks, which are reticulated in young individuals.

Brazil and Guiana.

a–c. Fine specimens. River Capin. Purchased of Mr. Stevens.
d. Adult. Guiana. Presented by Sir R. Schomburgk.
e. Half-grown. Guiana. From Mr. Frank's Collection.
f. Young. From the Collection of the Zoological Society.

In a specimen which I examined, in the Berlin Anatomical Museum, I found the third anal ray prolonged into a filament; D. $\frac{17}{11}$.

18. SYMPHYSODON.

Symphysodon, *Heckel, Brasil. Fluss-Fische, in Ann. Wien. Mus.* ii. 1840, p. 332.

Body much compressed and elevated, covered with small ctenoid scales. One dorsal, the spinous portion of which is of less extent than the soft; anal spines 8–10; the soft dorsal and anal scaly. Teeth small, occupying only the symphysial portions of the jaws.

Branchial arches with the anterior prominences very obsolete. Cleft of the mouth small and very oblique. Scales on the cheek small, in numerous series.

Brazil.

1. Symphysodon discus.

Heckel, l. c. p. 333.

D. $\frac{9}{31}$. A. $\frac{8(-10)}{27(-24)}$. L. lat. 52. L. transv. 17/34.

Nearly as high as long (the caudal not included). Scales on the cheek small, arranged in seven or eight series. Brown, with a vertical band descending from the nape to the eye, another band round the base of the caudal, and sometimes a third across the middle of the body.

Brazil.

a. Adult. River Cupai (800 miles from the sea). Purchased of Mr. Stevens.

19. PTEROPHYLLUM.

Pterophyllum, *Heckel, Brasil. Fluss-Fische, in Ann. Wien. Mus.* ii. 1840, p. 334.

Plataxoides, *Casteln. Anim. nouv. ou rares de l'Amér. Sud, Poiss.* p. 21.

Body much compressed and elevated, covered with ctenoid scales of rather small size. The soft portions of the vertical fins are more developed than the spinous; anal spines six. The basal portions of the dorsal and anal scaly. The teeth in the jaws form narrow bands. The anterior prominences of the outer branchial arch setiform, rather short. Cleft of the mouth oblique, of moderate width. Scales on the cheek small. Anterior part of the soft dorsal and anal, and the first ventral ray exceedingly long; caudal truncated.

Brazil.

1. Pterophyllum scalare.

Platax scalaris, *Cuv. & Val.* vii. p. 237.

Pterophyllum scalaris, *Heckel, l. c.* p. 335.

Plataxoides dumerilii, *Casteln. l. c.* pl. 11. fig. 3.

D. $\frac{10-13}{25-26}$. A. $\frac{6}{28}$. L. lat. 37–40.

Head and body somewhat longer than high (the caudal not included). Silvery, with four blackish vertical bands: one from the origin of the dorsal, through the eye, to the chest; the second from the middle of the spinous dorsal to the vent; the third is the broadest, crossing the middle of the tail; the fourth round the base of the caudal. Some less dark bands descend downwards between the others to the middle of the body. Dorsal and anal with longitudinal, caudal with transverse blackish bands.

Brazil.

a. Fine specimen. River Cupai (800 miles from the sea). Purchased of Mr Stevens.

Order III. ANACANTHINI.

Vertical and ventral fins without spinous rays* The ventral fins, if present, are jugular or thoracic. Air-bladder, if present, without pneumatic duct.

Cfr. Müller, in Berl. Abhandl. 1844, p. 174.

Synopsis of the Families.

A. ANACANTHINI GADOIDEI.

Structure of the head symmetrical.

The smaller portion of the dorsal and anal fins is formed by spines	1. **Gadopsidæ**, p. 318.
Gill-opening narrow, the gill-membranes being attached to the isthmus. Vertical fins confluent into one	2. **Lycodidæ**, p. 319.
Gill-openings wide, the gill-membranes not attached to the isthmus. Ventral fins composed of several rays, or, if they are reduced to a filament, the dorsal is divided into two. Either the caudal free from dorsal and anal, or, if the vertical fins are united, the dorsal with a separate anterior portion. Rays of the second dorsal well developed..	3. **Gadidæ**, p. 326.
Gill-openings wide, the gill-membranes not attached to the isthmus. Ventral fins rudimentary (reduced to a filament), or absent, jugular †. No separate anterior dorsal. Caudal generally united with dorsal and anal........	4. **Ophidiidæ**, p. 370.
A separate anterior dorsal; the second continued on to the point of the tail, and composed of very feeble rays. No caudal fin. Ventrals composed of several rays, jugular or thoracic....	5. **Macruridæ**, p. 390.

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* With the exception of *Gadopsis*, p. 318.

Except in *Brotulophis*.

One short anterior dorsal, and no other.
Ventrals reduced to filaments, jugular. 6. **Ateleopodidæ**, p. 398.
Appendix . . . . **Xenocephalus**, p. 399.

B. ANACANTHINI PLEURONECTOIDEI.

The two sides of the head unsymmetrical.

Only one family . . . . 7. **Pleuronectidæ**, p. 399.

Before entering into an account of the true Gadoid fishes, we must intercalate the type of a separate family, which, although having every character of a Gadoid, has true spines in the dorsal and anal fins, thus forming a connecting link between the Acanthopterygians and Malacopterygians. The structure of the dorsal fin, the presence of pyloric appendages, &c., prevent its being placed among the Blennoids.

Fam. 1. GADOPSIDÆ.

A small portion of the dorsal and anal fins is formed by true spines. Ventrals jugular. Gill-openings wide.

Only one genus.

1. GADOPSIS.

Gadopsis, *Richards. Voy. Ereb. & Terr. Fishes*, p. 122.

Body slightly elongate, covered with very small scales. Snout of moderate extent, obtuse, with the upper jaw overlapping the lower; cleft of the mouth of moderate width; small cardiform teeth in the jaws, on the vomer and the palatine bones. One dorsal, the spinous portion being rather shorter than the soft; anal spines three; caudal distinct. Ventrals jugular, composed of a single bifid ray. Branchiostegals six; gills four, with a narrow slit behind the fourth; pseudobranchiæ present, glandular; gill-opening wide; gill-membranes not united. An air-bladder; pyloric appendages in moderate number.

Fresh waters of South Australia and Tasmania.

1. Gadopsis marmoratus.

Richards. l. c. pl. 59. figs. 6–11.

B. 6. D. $\frac{10\text{–}11}{25\text{–}26}$. A. $\frac{3}{18\text{–}19}$. V. 1.

The dorsal and anal fins are enveloped in thick skin; ventral longer than pectoral. Reddish-brown, marbled with darker.

Fresh waters of South Australia and Tasmania.

a. Skin, in spirits. Australia. From Mr. Gould's Collection.

b. Fine specimen, four inches long. Van Diemen's Land. Presented by R. Gunn, Esq.—"Freshwater Trout, very common in the rivers and rivulets of Van Diemen's Land; they attain to twice the size of the present specimen."

Fam. 2. LYCODIDÆ.

Vertical fins confluent into one, without any spines. Ventral fin, if present, small, attached to the humeral arch, jugular. Gill-opening narrow, the gill-membrane being attached to the isthmus.

This family also bears a strong resemblance to some of the Blennoid fishes, yet several of them show pyloric appendages; they have neither spines in the fins, nor a prominent anal papilla.

Synopsis of the Genera.

Ventral fins small	1. Lycodes, p. 319.
Ventral fins none; jaws equal anteriorly	2. Gymnelis, p. 323.
Ventral fins none; the lower jaw longest	3. Uronectes, p. 325.

1. LYCODES [*]

Lycodes, *Reinhardt, Dansk. Vidensk. Selsk. Afhandl.* vii. 1838, p. 147.

Body elongate, covered with minute scales imbedded in the skin or naked; lateral line more or less indistinct. Eye of moderate size. Vertical fins united; ventral small, short, rudimentary, jugular, composed of several rays. Upper jaw overlapping the lower. Conical teeth in the jaws, on the vomer and on the palatine bones. Barbel none. Five or six branchiostegals; gill-opening narrow, the gill-membranes being attached to the isthmus. Pseudobranchiæ present. Air-bladder none. Pyloric appendages two or rudimentary, or entirely absent. No prominent anal papilla.

a. Ventral fins shorter than one-fourth of the pectorals:
Lycodes, Reinh.—Greenland.

1. Lycodes vahlii.

Reinhardt, l. c. p. 153. tab. 5.

D. 116–117. A. 91–95. V. 4. Vert. 25/87.

The height of the body is rather more than one-half of the length of the head, which is contained four times and a third in the total. Head nearly twice as long as high; snout long, the upper maxillary extending to below the middle of the eye. The distance of the vent from the ventrals is nearly equal to the length of the head. Vertical fins enveloped in a thick scaly skin. Brownish-yellow, with six blackish cross-bands extending on the dorsal fin and confluent on the belly; the first cross-band on and below the anterior dorsal rays, the second above the vent. Each scale lighter than the ground-colour.—Pyloric appendages rudimentary.

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[*] 1. Lycodes nebulosus, *Kröyer in Dansk. Vidensk. Selsk. Afhandl.* xi. 1845, p. ccxxxiii.—Greenland.

Greenland.

Eighteen inches long.

2. Lycodes perspicillum.

Kröyer in Dansk. Vidensk. Selsk. Afhandl. xi. 1845, p. ccxxxiii, and in *Gaim. Voy. Scand. Poiss.* pl. 7.

The height of the body is more than one-half of the length of the head, which is one-fourth of the total. Head not quite twice as long as high; snout long, the upper maxillary extending to below the middle of the eye. The distance of the vent from the ventrals is nearly equal to the length of the head. Yellowish, with nine or ten brownish cross-bands, edged with dark-brown, and broader than the interspaces: the first occupies the upper parts of the head, and encloses a pair of roundish yellowish spots situated behind the level of the eyes; the second cross-band is on and before the anterior dorsal rays.

Greenland.

3. Lycodes reticulatus.

Reinhardt, l. c. p. 167. tab. 6.

D. 93–95. A. 75. V. 4. Cæc. pyl. 2.

The height of the body is one-half of the length of the head, which is one-fourth of the total. Head twice as long as high; snout long, the maxillary extending to behind the middle of the eye. The distance of the vent from the ventrals is somewhat more than the length of the head. Trunk scaly; vertical fins naked. Brownish, with reticulated black lines on the head and body; those on the body being disposed in five groups or cross-bands, the three anterior of which emit one or two vertical streaks on the dorsal fin.

Greenland.

Fourteen inches long.

4. Lycodes seminudus.

Reinhardt, l. c. p. 223.

D. 91. A. 71. Cæc. pyl. 2.

The height of the body is less than the length of the head, which is two-sevenths of the total. Head twice as long as high; snout long. The distance of the vent from the ventrals is somewhat more than the length of the head. Trunk and vertical fins naked. Colours uniform.

Omenak (Greenland).

Seventeen inches long.

5. Lycodes mucosus.

Richards. Last of the Arct. Voy. p. 362. pl. 26.

D. 90. A. 70. V. 3. Vert. 26/66. Cæc. pyl. 2.

Without any scales. The height of the body is more than one-half of the length of the head, which is one-fourth of the total. Head twice as long as high; snout long. The distance of the vent from the ventrals is more than the length of the head. Vertical fins enveloped in lax skin. Dark-brownish-black, with irregular white markings in the form of five narrow bars across the back; lower parts of the head and trunk whitish.

Northumberland Sound.

a. Fine specimen. From the Haslar Collection.—Type of the species.

6. Lycodes polaris.

Blennius polaris, *Sabine in Parry's Journ. Voy.* 1819–20, *Suppl.* p. 212; *Ross, App. to Parry's Voy.* p. 200, and *App. to the Narrat. of a Second Voy.* p. 52. no. 8.
Zoarces polaris, *Richards. Faun. Bor.-Amer. Fish.* p. 94.
Lycodes polaris, *Richards. Last Arct. Voy.* p. 362.

"Without any scales. Length of the pectoral exceeding twice its breadth, having fifteen rays. Yellowish, lighter on the belly, with eleven large saddle-shaped markings across the back, the middle of these markings being much lighter than their edges; the whole back and the sides marbled."

Coast of North Georgia, near 75° lat.

b. Ventral fins longer than one-fourth of the pectorals; pyloric appendages none: *Iluocœtes* et *Phucocœtes*, Jenyns, Zool. Beagle, Fishes, pp. 165 & 168.—Falkland Islands; Chiloë.

7. Lycodes latitans.

Phucocœtes latitans, *Jenyns, l. c.* p. 168. pl. 29. fig. 3.

D. 103. A. 72. V. 3.

Brownish; head with some lighter spots.

Falkland Islands.

a, b, c. Adult and half-grown. Falkland Islands. Presented by W. Wright, Esq.

Description.—Head, body and fins enveloped in a tough and lax skin; head depressed, broader than high, its greatest width being contained once and three-fourths in its length, which is one-sixth of the total. Snout obtusely rounded, with the upper jaw overlapping the lower, twice as long as the small eye, the diameter of which is one-eighth of the length of the head. Cleft of the mouth horizontal, of moderate width, the maxillary not extending to below the posterior margin of the eye. The teeth in the jaws, on the vomer and the palatine bones are rather small, conical, in a single series; two, in front of the upper and lower jaws, are a little larger than the rest, and there are some other small teeth behind them. The single nostril is situated anteriorly on the end of the snout, at the extremity of a short cutaneous tube: a row of pores along the upper jaw Interorbital space flat, and much wider than the eye. Gill-opening very narrow, the gill-membranes being attached to the isthmus; branchiostegals six; gills four, a slit behind the fourth; pseudobranchiæ small; tubercles on the concave side of the first branchial arch very small.

The height of the trunk is one-ninth or one-tenth of the total length. Tail prolonged and compressed. The distance of the vent from the ventral fins is twice the length of the head. The dorsal commences immediately behind the root of the pectoral; its upper margin is even: caudal very short. Length of the pectoral about two-thirds of that of the head. Ventrals thin, rather close together, their length being one-third of that of the pectoral.

Length of the largest specimen 7 inches.

8. **Lycodes variegatus.**

D. 73. C. ca 13. A. 65. V. 2.

Jaws not fringed. Yellowish, variegated with brown or brownish-violet.

Falkland Islands.

a–b. Fine specimens. Presented by W. Wright, Esq.

Description.—Head depressed, broader than high, its greatest width being contained once and two-thirds in its length, which is two-ninths of the total. Snout obtusely rounded, longer than the eye, which is elongate-ovate, its horizontal diameter being one-fifth of the length of the head. Eyes directed obliquely upwards, rather close together, the width of the interorbital space being less than the horizontal diameter of the orbit. The upper jaw overlaps the lower; both are provided with a series of pores, which, however, are not situated on tubes, as is the case in the following species. Cleft of the mouth horizontal, of moderate width, the maxillary extending nearly to below the posterior margin of the eye. Teeth in the jaws and on the palatines in a single series, on the vomer in a narrow patch: the two front teeth of the upper jaw and a lateral pair in the lower are enlarged, canine-like; they are more distinct in the larger individual than in the smaller. A short cutaneous tube, situated anteriorly on the extremity of the snout, is pierced by the nostril.

The skin of the body and tail shows numerous small round pigmentless impressions, which might be taken for rudimentary scales. The height of the trunk is one-tenth of the total length; the distance of the vent from the ventrals equals the length of the head. The dorsal fin commences immediately behind the root of the pectoral; it is rather elevated, the height of its anterior portion being equal to, or even more than, the depth of the body underneath. Caudal fin very short. The length of the pectoral is three-fifths of that of the head. Ventrals thin, rather close together, one-third as long as the pectorals.

Yellowish: head, body and fins with irregular larger and smaller brownish-violet spots, forming irregular oblique bands posteriorly;

dorsal and anal with the margins of the same colour; a brown streak from the eye to the front part of the snout.

Length of the larger specimen 5 inches.

9. **Lycodes fimbriatus.**

Iluocœtes fimbriatus, *Jenyns, Zool. Beagle, Fishes,* p. 166. pl. 29. fig. 2.

B. 5. D. ca 80. C. ca 15. A. ca 60. V. 3.

The edges of both jaws are fringed with a row of tubiform cutaneous appendages. The height of the body is rather more than one-half of the length of the head, which is one-fifth of the total. Upper jaw overlapping the lower; the maxillary extends to below the posterior margin of the eye. Snout as long as the eye, the diameter of which is one-fourth of the length of the head; interorbital space narrow. The dorsal commences above the extremity of the operculum. The distance of the vent from the base of the pectoral is nearly equal to the length of the head. Ventral fin thin, like a short filament, one-third of the length of the pectoral, which is two-thirds of that of the head. Coloration uniform. (*Jen.*)

Archipelago of Chiloë.

2. GYMNELIS.

Gymnelis, *Reinh. Dansk. Vidensk. Selsk. Afhandl.* vii. 1838, p. 131.
Cepolophis, *Kaup in Wiegm. Arch.* 1856, p. 96.

Body elongate, naked (scaly in *G. stigma*). Eye of moderate size or rather small. Vertical fins united; ventrals none. Vent situated at some distance backwards from the head. Small conical teeth in the jaws, on the vomer and the palatine bones. Jaws equal anteriorly. Barbel none. Six branchiostegals; gill-opening narrow, the gill-membranes being attached to the isthmus; pseudobranchiæ present. Air-bladder none. Pyloric appendages two; no prominent anal papilla.

Arctic Seas of America. (South coast of England.)

1. **Gymnelis viridis.**

Ophidium viride, *Fabr. Faun. Grœnl.* p. 141; *Bl. Schn.* p. 486; *Ross, Suppl. Parry's Third Voy.* p. 110; *Reinh. in Dansk. Vidensk. Selsk. Afh.* v. 1832, p. liv.
—— unernak, *Lacép.* ii. p. 280.
Gymnelis viridis, *Reinh. l. c.* vii. 1838, p. 131; *Gaim. Voy. Scand. Poiss.* pl. 15; *Richards. Last Arct. Voy.* p. 367. pl. 29 (head too long, origin of the dorsal too far advanced); *Kaup, Apodal Fish.* p. 156.
—— viridis, var. unimaculatus, *Richards. l. c.* p. 371. pl. 30.
Cepolophis viridis, *Kaup in Wiegm. Arch. l. c.*

B. 6. D. 100. A. 80. Vert. 22/71 (*Rich.*). Cæc. pyl. 2.

The dorsal fin commences above the posterior part of the pectoral. The skin which covers the dorsal fin or its base with one or several round black spots.

Coasts of Arctic America.

Var. *a*. With one to three pairs of dorsal spots.

a–b, c, d. Adult and half-grown. Greenland.
e. Adult. Purchased of Mr. Brandt.
f. Adult. From the Haslar Collection.

Var. *β*. Without black spots.

g. Young. Greenland.
h. Young. 72° lat. Presented by Capt. Sir J. Ross.

Description.—The head, body and fins are enveloped in a thick lax skin: the head is rather low, and in individuals with very fleshy cheeks it is as broad as high; its height is one-half of its length, and the latter one-seventh or one-sixth of the total. Snout subconical, longer than the eye, the diameter of which is one-seventh of the length of the head; jaws equal anteriorly. Cleft of the mouth oblique, of moderate width, the maxillary extending behind the vertical from the hinder edge of the orbit. Teeth rather small, conical, in a single series on the sides of the jaws, whilst they are crowded anteriorly, forming a patch. Vomer and palatines with a series of similar teeth. The bony part of the interorbital space is narrow and slightly convex. The operculum terminates in a soft and short flap. Gill-opening narrow, not extending downwards to the lower part of the root of the pectoral. Gills four, a slit behind the fourth; pseudobranchiæ composed of short lamellæ.

The height of the body is equal to, or more than, one-half of the length of the head. The distance of the vent from the extremity of the snout is twice and a third the length of the head. The pectoral is inserted near the lower profile; it is rounded, and its length is rather less than one-half of that of the head. The dorsal commences above the posterior third of the pectoral; its margin is even, and its rays of moderate length: the anal commences immediately behind the vent.

Brown (in spirits); generally with one to four round black spots on each side of the membrane covering the anterior part of the dorsal fin; anal sometimes with a black edge.

Ten to twelve inches long.

2. **Gymnelis pictus.**

D. 85. A. 66.

The dorsal fin commences somewhat before the middle of the pectoral. Dorsal without round black spots.

Hab. ——?

a–b. Half-grown and young. From the Haslar Collection.

This species is similar to *G. viridis,* but differs in the following points, besides those mentioned:—

1. The maxillary extends to the posterior margin of the eye in the older specimen, but not in the young individual. The diameter of the eye is one-sixth of the length of the head, which is one-seventh of the total.

2. The length of the pectoral is one-half of that of the head.

The young individual is marked with eleven broad cross-bands, lighter on the middle and darker on the edges. In the older specimen these cross-bands are broken up into irregularly reticulated lines, passing from one band more or less into another.

Length of the larger specimen 66 lines.

Length of the young specimen 27 lines.

The two following species probably do not belong to this genus.

3. Gymnelis stigma.

Ophidium stigma, *Richards. in Voy. Bloss. Fish.* p. 67. pl. 20. fig. 1.

Scales very small; no trace of ventrals. Yellowish, with irregular transverse series of brown spots. A roundish purplish spot near the origin of the dorsal. (*Rich.*)

Kotzebue Sound.

4. Gymnelis imberbis.

Ophidium imberbe, *L. Syst. Nat.* i. p. 431; *Lacép.* ii. p. 279; *Montag. in Wern. Mem.* i. p. 95. pl. 4. fig. 2; *Turton, Brit. Faun.* p. 88; *Flem. Brit. An.* p. 201; *Jen. Man.* p. 481; *Yarr. Brit. Fish.* 2nd edit. ii. p. 412.

Beardless Ophidium, *Penn. Brit. Zool.* iii. *App.* p. 346, iv. pl. 93, and edit. 1812, iii. p. 208. pl. 29 (cop. *Mont.*).

Cepolophis montagui, *Kaup in Wiegm. Arch.* 1856, p. 97.

Gymnelis imberbis, *Kaup, Apod. Fish.* p. 156; *Yarrell,* 3rd edit. i. p. 79.

D. 77. C. 18–20. A. 44.

The dorsal fin commences immediately behind the root of the pectoral. The distance of the vent from the root of the pectoral is much more than the length of the head. Ten small bluish-white spots along the base of the anal.

South coast of England.

3. URONECTES.

Body ensiform, compressed; tail tapering. Vertical fins united; ventrals none. Vent not very distant from the head. Numerous minute teeth in the jaws and on the palate; the lower jaw is the longest. Barbel none.

Coasts of Arctic America.

Our knowledge of the fish on which I have founded this genus is very limited, and it is not certain whether it really belongs to this family; but the attention of ichthyologists is more likely to be drawn to it while standing as a separate generic group, than if it had been referred as a doubtful species to one of the other genera.

1. Uronectes parrii.

Ophidium parrii, *Ross in Parry's Third Voy. App.* p. 109.

D. 50. A. 45. P. 37.

Head very obtuse, being equal in its length, depth, and transverse diameter, broader than the body, flattened and grooved between the eyes, which are lateral and rather large. The greatest depth of the body is somewhat more than the length of the head, which is one-fourth of the total (without caudal). Neck much arched. The dorsal fin rises just behind the head; pectoral extending beyond the vent. Coloration uniform.

Baffin's Bay; Prince Regent's Inlet.

Specimens 8 inches long were observed.

Fam. 3. GADIDÆ.

Gadoidei, part., *Cuv.*, *Müll.*
Gadidæ, part., *Owen.*

Body more or less elongate, covered with small smooth scales. One, two or three dorsal fins, occupying nearly the whole of the back; rays of the posterior dorsal well developed: one or two anal fins. Caudal free from dorsal and anal, or, if they are united, the dorsal with a separate anterior portion. Ventrals jugular, composed of several rays; or, if they are reduced to a filament, the dorsal is divided into two. Gill-opening wide; the gill-membranes generally not attached to the isthmus. Pseudobranchiæ none or glandular, rudimentary. An air-bladder and pyloric appendages generally present.

Mostly inhabitants of the sea. Arctic and temperate regions.

Synopsis of the Genera.

* *Three dorsal and two anal fins.*	
Vomerine teeth	1. Gadus, p. 327.
No vomerine teeth	2. Gadiculus, p. 341.
** *Two dorsal and two anal fins.*	
Vomerine teeth	3. Mora, p. 341.
No vomerine teeth. Teeth in the jaws villiform, of equal size	4. Halargyreus, p. 342.
*** *A separate anterior dorsal; caudal united with the second and with the anal.*	
No vomerine teeth	5. Strinsia, p. 344.

**** *Two dorsal, one anal, and a separate caudal.*

Ventrals well developed, with broad base; strong teeth in the jaws and on the vomer; barbel none	6. **Merluccius**, p. 344.
Ventrals with flat base and several rays; vomerine teeth none; jaws with an outer series of stronger teeth. A barbel	7. **Lotella**, p. 346.
Ventrals with flat base and several rays; vomerine teeth none; teeth in the jaws villiform, of equal size. A barbel	8. **Physiculus**, p. 348.
Ventrals with flat base and several rays; vomerine teeth none. The first dorsal well developed. Barbel none	9. **Uraleptus**, p. 349.
Ventrals with styliform base and several rays; vomerine teeth none; teeth in the jaws villiform, of equal size. A barbel	10. **Pseudophycis**, p. 350.
Ventrals reduced to a bifid filament; first dorsal with 8–10 rays	11. **Phycis**, p. 351.
Ventrals reduced to a bifid filament; first dorsal with five rays	12. **Læmonema**, p. 356.
Ventrals with flat base and several rays; vomerine teeth. First dorsal with four rays	13. **Haloporphyrus**, p. 358
The first dorsal well developed, with 10–13 rays; ventral composed of several rays. Head not compressed. Vomerine teeth; all the teeth villiform	14. **Lota**, p. 359.
The first dorsal well developed, with 10–16 rays; ventral composed of several rays. Head not compressed. Several large teeth on the mandible and on the vomer	15. **Molva**, p. 361.
The first dorsal well developed, with six rays; head compressed. Vomerine teeth. A barbel	16. **Hypsiptera**, p. 362.
The first dorsal reduced to a band of fringes; head compressed	17. **Couchia**, p. 363.
The first dorsal reduced to a band of fringes; head not compressed	18. **Motella**, p. 364.
The first dorsal rudimentary, short. A barbel	19. **Raniceps**, p. 367.
The first dorsal reduced to a single ray on the occiput	20. **Bregmaceros**, p. 368.

***** *One dorsal and one anal.*

Ventrals composed of several rays; vomerine and palatine teeth	21. **Brosmius**, p. 369.

1. GADUS *.

Gadus, sp., *Artedi, Genera*, p. 19.
Gadus et Merlangus, *Cuv. Règne Anim.*
Morua et Merlangus, *Risso, Eur. Mérid.* iii. pp. 225, 227.
Morrhua et Merlangus, *Auct.*

Body moderately elongate, covered with small scales. A separate caudal, three dorsal and two anal fins; ventrals narrow, composed of six or more rays. Teeth in the upper jaw in a narrow band; vomerine teeth; none on the palatines. Branchiostegals seven.

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* 1. Gadus gracilis, *Tiles. Mém. Ac. Sc. St. Pétersb.* ii. 1810, p. 354. tab. 18. Kamtschatka.

Seas of the polar and temperate regions of the northern hemisphere.

I divide the species of this genus into the following groups:—

A. Upper jaw longest; teeth in the outer series of the upper jaw stronger than the others (*Gadus*, m.), p. 328.

B. Lower jaw longest; teeth in the outer series of the upper jaw stronger than the others (*Boreogadus*), p. 336.

C. Lower jaw longest; teeth in the upper jaw of equal size (*Pollachius*), p. 338.

A. Upper jaw longest; teeth in the outer series of the upper jaw stronger than the others (*Gadus*).

1. Gadus morrhua.

Codfish. Cabeljau (old and fresh), Dorsch (young and fresh), Stockfisch (dried), Laberdan (salted). Kabeljä and Torsk (Sweden).

Synonymy of the adult European Cod.

Morrhua vulgaris, *Bellon. De Aquat.* p. 128.
Molva, *Rondel.* ix. c. 14. p. 280; *Gesner*, pp. 88, 102.
Morrhua s. Molva, *Aldrov.* iii. c. 6. p. 289; *Jonst.* i. tit. 1. c. 1. art. 2. tab. 2. fig. 1.
Asellus major, *Schonev.* p. 18; *Willughby*, p. 165. tab. L, M. 1. fig. 4; *Ray, Syn.* p. 53.
Gadus, sp., *Artedi, Syn.* p. 35. no. 6.
Gadus morrhua, *L. Syst.* i. p. 436; *Bl. Fische Deutschl.* ii. p. 145. taf. 64; *Bl. Schn.* p. 7; *Lacép.* ii. p. 369; *Turt. Brit. Faun.* p. 89; *Donov. Brit. Fish.* v. pl. 106; *Mitch. Lit. & Phil. Trans. New York*, i. p. 367; *Faber, Fische Isl.* p. 104; *Richards. Faun. Bor.-Amer. Fish.* p. 242; *Jen. Man.* p. 440; *Nilss. Skand. Faun.* iv. p. 537; *Brandt & Ratzeb.* i. p. 46. tab. 9. fig. 3; *Cuv. Règne Anim. Ill. Poiss.* pl. 106. fig. 1.
Callarias, *Klein, Pisc. Miss.* v. p. 6. no. 4. tab. 1. fig. 1.
? Gadus morrhua, *Fabr. Faun. Grœnl.* p. 146.
Ascan. Ic. tab. 4 & 27.
Codfish, *Penn. Brit. Zool.* iii. p. 152; ed. 1812, ii. p. 221.
Morue, *Duham. Pêches*, ii. sect. 1. p. 37. pl. 12. fig. 1.
Gadus callarias, *Fries och Ekstr. Skand. Fisk.* p. 191. taf. 47.
Morrhua vulgaris, *Flem. Brit. An.* p. 191; *Yarr. Brit. Fish.* 2nd edit. ii. p. 221, and 3rd edit. i. p. 524; *Parn. Wern. Mem.* vii. p. 334, or *Fishes Frith of Forth*, p. 173.
Skeleton: *Brandt & Ratzeb.* i. tab. 8. fig. 2 (skull of *G. callarias*).
Anatomy: *Delaroche, Ann. Mus.* xiv. 1809, p. 279.

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2. Merlangus vernalis, *Risso, Eur. Mérid.* iii. p. 228.—Mediterranean.
3. Gadus purpureus, *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 370.—Merlangus purpureus, *Storer, Fish. Massach.* p. 130; *Dekay, New York Fauna, Fish.* p. 286. pl. 45. fig. 147.—Northern United States.
4. Merlangus leptocephalus. *Dekay, l. c.* p. 288. tab. 45. fig. 146.—New York.
5. Gadus wachna, *Pall. Zoogr. Ross.-As.* iii. p. 182.—Kamtschatka.
6. —— pygmæus, *Pall. Zoogr. Ross.-As.* iii. p. 199.—N.W. coast of America.

Synonymy of the younger state of the European Cod.

Asellus varius vel striatus, *Schonev.* p. 19; *Jonston*, tab. 46. fig. 4; *Willughby*, p. 172. tab. L, M. 1. fig. 1; *Ray, Syn.* p. 54.
Gadus, sp., *Artedi, Syn.* p. 35. no. 4; *Spec.* p. 63. no. 4; *Gen.* p. 20. no. 4; *Gronov. Zoophyl.* no. 319.
Gadus callarias, *L. Syst. Nat.* i. p. 436; *Bl. Fische Deutschl.* ii. p. 109. taf. 63; *Bl. Schn.* p. 6; *Lacép.* ii. p. 409; *Pall. Zoogr.* iii. p. 182; *Turt. Brit. Faun.* p. 89; *Jen. Man.* p. 441; *Faber, Fische Isl.* p. 109; *Ekstr. Fische Mörkö*, p. 230, or *Vet. Akad. Handl.* 1834, p. 38; *Gronov. Syst. ed. Gray*, p. 131; *Brandt & Ratzeb.* i. p. 49. tab. 9. fig. 2.
? Gadus barbatus, pt., *L. Syst. Nat.* i. p. 437.
Gadus callarias, var. *a*, *Fabr. Faun. Grœnl.* p. 144.
Variable Codfish, *Penn. Brit. Zool.* ed. 1812, iii. p. 239.
Callarias, sp., *Klein, Pisc. Miss.* v. p. 5. nos. 1 & 5. tab. 1. fig. 2, nos. 6 & 7. tab. 2. figs. 1, 2.
Morrhua callarias, *Cuv. Règne Anim.*

Synonymy of the Greenland variety.

? Gadus barbatus, *Fabr. Faun. Grœnl.* p. 146; *Mohr, Isl. Naturh.* p. 68. *Ascan. Ic.* tab. 5.
Gadus ruber, *Lacép.* v. p. 673.
? Gadus ogak, *Richards. Faun. Bor.-Amer. Fish.* p. 246 (cop. *Fabr.*).
Gadus ogat, *Gaim. Voy. Scand. Atl. Poiss.* pl. 19.
—— ruber, *Holböll, Göth. Nya Handl.* iv. p. 31. c. fig.

D. 13 | 16–19 | 17–19. A. 18–19 | 17–18. Vert. 19/32.

Barbel rather long, as long as, or longer than, the eye, which is one-seventh of the length of the head, and one-half, or rather more than one-half, of the width of the interorbital space. Snout more than twice as long as the eye, obtuse, with the upper jaw longest. The height of the body is less than the length of the head, which is two-sevenths of the total (without caudal). The vent is situated vertically below the anterior rays of the second dorsal. The two anal fins separated from each other by an interspace. Proportions of the fins:—

1 D. 2 D. 3 D. 1 A. 2 A.
1 : 1·3 : 1·1 : 1·2 : 1–0·9

Greenish- or brownish-olive, with numerous yellowish or brown spots on the back and on the sides.

Coasts of Northern Europe, Iceland and Greenland, southwards to New York.

The Greenland specimens appear to have generally a dark-brown colour, sometimes with a large irregular black blotch on the sides. A similar dark variety has been observed also in Iceland and in Scotland.

a. *European specimens.*

a. Fine specimen. London market.
b. Young. British coast. From Mr. Yarrell's Collection.
c–h. Skins of young British specimens. From Mr. Yarrell's Collection.
i. Young: stuffed. English coast.

k. Four inches long. Frith of Forth (July).
l. Two inches long. Tweed. Presented by Dr. Johnston.
m, *n*. Young. Baltic. From the Haslar Collection.
o. Three inches long. Norway. Presented by G. Woodfall, Esq.
p. Three inches long. Båhuslän. Presented by Hr. A. W. Malm.
q. Young: skin. From Gronow's Collection.

b. *Greenland variety* (G. ogak).

r. Half-grown. Greenland.—Uniform brown.
s–t. Adult: stuffed. Greenland.—With a black lateral blotch.

c. *Skeletons*.

u–v. Large specimens. British.
w. Skull. German Ocean. From Dr. A. Günther's Collection.

Detailed descriptions have been given by Artedi, Ekström, Parnell, and Nilsson.

2. Gadus navaga.

Kötreuter in Nov. Comm. Acad. Petrop. xiv. 1770, p. 484. tab. 12
Lepechin, ibid. xviii. 1774, p. 512 (foot-note); *Pall. Zoogr. Ross.-As.* iii. p. 196.

D. 12–14 | 16–20 | 19–22. A. 21–24 | 23–24.
Cæc. pylor. 40–50. Vert. 58.

Barbel small, shorter than the eye, the diameter of which is somewhat less than the width of the interorbital space, and one-half of the extent of the snout. Snout subconical, obtuse, with the upper jaw longest. The height of the body is less than the length of the head, which is one-fourth of the total (without caudal). The vent is situated vertically below the origin of the second dorsal. Tail very slender; fins separated by interspaces from one another. Proportions of the fins:—

1 D. 2 D. 3 D. 1 A. 2 A.
1 : 1·5 : 1·2 : 1·8 : 1·2

Caudal fin truncated. Brownish, with reticulated dark lines on the back.

Coasts of Northern Russia.

a, *b–c*. Seven to nine inches long. White Sea.

3. Gadus macrocephalus.

Wachnja.
Gadus macrocephalus, *Tiles. Mém. Acad. Sc. St. Pétersb.* ii. 1810, p. 350. tab. 16.

Barbel as long as, or longer than, the eye. Head very large, its length being more than one-third of the total (the caudal included). The body is lower than the head is long. Upper jaw longest. The vent is situated vertically below the origin of the second dorsal.

Vertical fins rather short, close together. Caudal truncated. The second ventral ray is prolonged into a filament.

Kamtschatka.

4. Gadus tomcodus.

The American Codfish.
? Gadus callarias, var. *β*, *Fabr. Faun. Grœnl.* p. 144.
Tom-cod, *Schoepf, Schrift. Gesellsch. Naturf. Freund.* viii. p. 140.
Gadus tom-cod, *Bl. Schn.* p. 8.
Frost Cod, *Penn. Arct. Zool. Suppl.* p. 114.
Gadus callarias, *Mitch. Lit. & Phil. Trans. New York*, i. p. 368.
—— tomcodus, *Mitch. Lit. & Phil. Trans. New York*, i. p. 368 (G. pruinosus).
? Gadus nanus, *Faber, Fische Isl.* p. 113.
Morrhua tomcodus, *Storer, Fish. Massach.* p. 126; *Dekay, New York Faun. Fishes*, p. 278. pl. 44. fig. 142.
—— americana, *Storer, l. c.* p. 120; *Dekay, l. c.* pl. 44. fig. 140.

D. 13–14 | 17–18 | 19. A. 22–23 | 18.

Barbel rather short, as long as the eye, which is one-sixth of the length of the head, and rather less than one-half the width of the interorbital space. Snout more than twice as long as the eye, obtuse, with the upper jaw longest. The height of the body is less than the length of the head, which is two-ninths of the total (without caudal). The vent is situated vertically below the last rays of the first dorsal. The two anal fins separated from each other by an interspace. Proportions of the fins:—

1 D.		2 D.		3 D.		1 A.		2 A.
1	:	1·6	:	1·1	:	2	:	1

Brownish or greenish, mottled with darker and lighter; adult specimens with small yellowish spots on the back.

Atlantic coasts of the Northern States of North America.

a. Fourteen inches long. Boston. Presented by B. Winstone, Esq.
b. Young: skin. New York. From Dr. Parnell's Collection.
c. Adult: stuffed. N. America. Presented by E. Doubleday, Esq.
d–g. Young. N. America. Purchased of Mr. Warwick.

It is very difficult to arrive at a correct idea as regards the species which have served for the descriptions of the earlier North American writers. It appears that Mitchill described the American Cod under two names—the adult state as *G. callarias*, and the young as *G. tomcodus*; just as European ichthyologists, induced by popular distinctions, named the old Codfish *G. morrhua*, and the immature *G. callarias*. The *G. morrhua* of Mitchill may be the European species. Storer also distinguishes two species: the old as *Morrhua americana* (not likely = *G. morrhua*, Mitch., as he supposes), and the young as *M. tomcodus*.

The fish described by Faber as *Gadus nanus*, and considered by him as identical with the second variety of *G. callarias*, Fabr., ought perhaps to be referred to the Tom Cod, both having the vent situated more forward than in the true Cods.

5. Gadus californicus.

Morrhua californica, *Ayres, Proc. Calif. Acad.* 1854, p. 9.

D. 12 | 16 | 18. A. 23 | 20.

Barbel present. The height of the body is less than the length of the head, which is one-fourth of the total (with the caudal fin). The vent is situated vertically below the hinder portion of the first dorsal. Fins separated from one another by interspaces; proportions of the length of their bases:—

1 D.		2 D.		3 D.		1 A.		2 A.
1	:	1·3	:	1·2	:	2	:	1·2

Coloration uniform.

San Francisco.

Girard considers his *G. proximus* (Proc. Acad. Nat. Sc. Philad. 1854, pp. 141, 154, and U. S. Pacif. R. R. Exped. Fishes, p. 142. pl. 40 *a*. figs. 5–8) as identical with the species described by Dr. Ayres. He gives the following as the numbers of the fins: D. 13 | 21 | 22. A. 26 | 21.

6. Gadus æglefinus.

The Haddock. Der Schell-fisch.
Tertia asellorum species, *Rondel.* ix. c. 11. p. 277; *Gesner*, p. 26. 100; *Aldrov.* iii. c. 1. p. 282.
Onos, *Willughby*, p. 170. tab. L, M. 1. no. 2; *Ray*, p. 55.
Asellus minor, *Schonev.* p. 18.
Gadus, sp., *Artedi, Species*, p. 64; *Synon.* p. 36. no. 7; *Genera*, p. 20. no. 5; *Gronov. Zoophyl.* no. 320, and *Mus.* i. no. 59.
Gadus æglefinus, *L. Syst. Nat.* i. p. 435; *Bl. Fische Deutschl.* ii. p. 188. taf. 62; *Bl. Schn.* p. 6; *Lacép.* ii. p. 397; *Donov. Brit. Fish.* iii. pl. 59; *Mitch. Lit. & Phil. Trans. New York*, i. p. 370; *Turt. Brit. Faun.* p. 89; *Jen. Man.* p. 441; *Fries och Ekstr. Skand. Fisk.* p. 86. tab. 19; *Nilss. Skand. Faun.* iv. p. 550; *Faber, Fische Isl.* p. 100; *Gronov. Syst. ed. Gray*, p. 131.
L'Anon, *Duhamel, Pêches*, ii. sect. 1. cap. 4. p. 133. pl. 23. fig. 1.
Callarias, sp., *Klein, Pisc. Miss.* v. p. 6. no. 2.
Isa, *Olafs. Isl. Reise*, § 528. tab. 26.
Hadock, *Penn. Brit. Zool.* iii. p. 158; ed. 1812, iii. p. 241.
Morrhua æglefinus, *Flem. Brit. Anim.* p. 191; *Yarr. Brit. Fish.* 2nd edit. ii. p. 233, 3rd edit. i. p. 536; *Parn. Wern. Mem.* vii. p. 337, or *Fish. Frith of Forth*, p. 177; *Storer, Fish. Massach.* p. 124; *Dekay, New York Fauna, Fish.* p. 279. pl. 43. fig. 138; *Thomps. Nat. Hist. Irel.* iv. p. 179.
Morhua punctatus, *Flem. l. c.* p. 192.
Air-bladder: *Delaroche, Ann. Mus.* xiv. 1809, p. 278.

D. 14–16 | 20–24 | 19–21. A. 24–25 | 21–22. V. 6. Vert. 23/31.

Barbel very short. Snout protruding, longer than the eye, with the upper jaw longest. The height of the body is less than, or equal to, the length of the head, which is contained thrice and four-fifths in the total length, the caudal rays not included. The vent is situated vertically below the origin of the second dorsal fin. The two anal fins separated from each other by an interspace. Proportions of the fins:—

	1 D.		2 D.		3 D.		1 A.		2 A.
a.	1	:	2	:	1·1	:	1·8	:	1·2
b.	1	:	2	:	1·5	:	1·9	:	1·5

Lateral line black; a blackish blotch below the lateral line, between pectoral and first dorsal.

British coasts. German Ocean. American shores of the North Atlantic.

a. Adult: stuffed. Frith of Forth.
b–d. Fine specimens. London market.
e. Half-grown: stuffed. English coast.
f. Half-grown: skin. From Gronow's Collection.
g. Adult: skeleton. British.
h. Half-grown: skeleton. Purchased of M. Parzudaki.
i. Adult: skull. German Ocean. From Dr. A. Günther's Collection.

Detailed descriptions of this species may be found in the works of Parnell, Yarrell, Nilsson, and of Fries and Ekström; the account of the latter authors is accompanied with an excellent figure.

The *skeleton* of this species is distinguished by the dilated parapophyses of the abdominal vertebræ, which are proportionally much longer than in *Gadus morrhua*: whilst these processes are shorter than the neural spines in the latter species, they exceed those spines in length in the Haddock. A second peculiarity exists in the lower (anterior) portion of the humerus, which is not thin and transparent as in the Codfish, but swollen into a more or less thick osseous mass.

7. Gadus euxinus.

Nordm. in Demid. Voy. Russ. Mérid. iii. p. 526. pl. 26. fig. 2 (good).

D. 13–14 | 16–17 | 20. A. 30 | 20–21.

Barbel very small; snout protruding, conical, much longer than the eye, with the upper jaw longest. Upper jaw with a canine-like tooth on each side. The height of the body is less than the length of the head, which is contained thrice and three-quarters in the total (without caudal). The vent is situated vertically below the middle of the first dorsal. Anal fins not continuous, close together. Caudal truncated. Proportions of the fins:—

1 D.		2 D.		3 D.		1 A.		2 A.
1	:	1·4	:	1·3	:	2·7	:	1·3

A black spot superiorly at the base of the pectoral.

Black Sea. Adriatic.

a. Ten inches long. Coast of Dalmatia. Purchased of Dr. J. Heckel as *G. minutus*.

8. Gadus merlangus.

Whiting. Hvitling (Sweden).
Secunda Asellorum species, *Rondel.* ix. c. 10. p. 276; *Gesner,* pp. 85, 99.
Asellus candidus primus, *Schonev.* p. 17.
—— minor alter, *Aldrov.* iii. c. 3. p. 287.
—— mollis major, *Willughby,* p. 170. tab. L, M. 1. no. 5; *Ray, Syn.* p. 55.
Gadus, sp., *Artedi, Syn.* p. 34. no. 1; *Spec.* p. 62. no. 1; *Genera,* p. 19. no. 1; *Gronov. Zoophyl.* no. 316.
Blege, *Ström, Söndm.* i. p. 270.
Gadus merlangus, *L. Syst. Nat.* i. p. 438; *Bl. Fische Deutschl.* ii. p. 161. taf. 65; *Bl. Schn.* p. 9; *Lacép.* ii. p. 424; *Turt. Brit. Faun.* p. 91; *Donov. Brit. Fish.* ii. pl. 36; *Faber, Fische Isl.* p. 93; *Fries & Ekstr. Skand. Fisk.* p. 81. taf. 18; *Cuv. Règne Anim. Ill. Poiss.* pl. 106. fig. 2; *Nilss. Skand. Faun.* iv. p. 553; *Gronov. Syst. ed. Gray,* p. 132.
Callarias, *Klein, Pisc. Miss.* v. p. 8. no. 3. tab. 3. fig. 2.
Whiting, *Penn. Brit. Zool.* iii p. 167, and edit. 1812, iii. p. 255.
Merlan, *Duhamel, Pêches,* ii. sect. 1. p. 128. pl. 22. fig. 1.
Merlangus vulgaris, *Flem. Brit. An.* p. 195; *Jen. Man.* p. 445; *Yarr. Brit. Fish.* 2nd edit. ii. p. 244, and 3rd edit. i. p. 548; *Parn. Wern. Mem.* vii. p. 342, or *Fish. Frith of Forth,* p. 182.
Air-bladder: *Delaroche, Ann. Mus.* xiv. 1809, p. 279.

D. 13–14 | 20–23 | 20–21. A. 33–35 | 22–24. Vert. 23/31.

Barbel none. Snout conical, twice the length of the eye, with the upper jaw longest. The height of the body is less than the length of the head, which is two-sevenths of the total (without caudal). The vent is situated vertically below the middle of the first dorsal. Anal fins not continuous, but very close together. Caudal truncated. Proportions of the fins:—

1 D. 2 D. 3 D. 1 A. 2 A.
1 : 2 : 1·3 : 2·8 : 1·2

A black spot in the axil of the pectoral.

Coasts of Northern Europe.

a–d. Adult and young: skins. Frith of Forth. From Dr. Parnell's Collection.
e. Young. Frith of Forth.
f–h. Fine specimens. London market.
i. Young: stuffed. English coast.
k–l. Young: skins. From Gronow's Collection.
m. Young: skins.
n–o. Adult and half-grown: skeletons. British.

The parapophyses of the abdominal *vertebræ* are proportionally rather short, much shorter than the neural spines. The anal fin extends forwards to the front part of the abdominal cavity; consequently the greater portion of the interhæmals belonging to the rays of the first anal are not attached to the vertebral column, but quite free between the abdominal muscles.

9. Gadus minutus.

Anthiæ secunda species, *Rondel.* vi. c. 12. p. 191. c. fig. mala; *Gesner,* pp. 56, 64.
Asellus mollis minor, *Willughby,* p. 171; *Ray,* p. 56.
—— mollis minimus, (*Jago*) *Ray,* p. 163. fig. 6.
Gadus, sp., *Artedi, Synon.* p. 36. no. 8; *Genera,* p. 21. no. 7.
Gadus minutus, *L. Syst. Nat.* i. p. 438; *Turt. Brit. Faun.* p. 90; *Jenyns, Man.* p. 444; *Fries och Ekstr. Skand. Fisk.* p. 78. tab. 17; *Retz. Faun. Suec.* p. 319; *Nilss. Skand. Faun.* iv. p. 547.
? Gadus minutus, *Bl. Fische Deutschl.* ii. p. 167. taf. 67. fig. 1; *Bl. Schn.* p. 7.
Gadus luscus, *Bl. Schn.* tab. 2.
—— capelanus, *Lacép.* ii. p. 411; *Risso, Ichth. Nice,* p. 111.
Poor, *Penn. Brit. Zool.* iii. p. 163. pl. 30, & edit. 1812, iii. p. 249. pl. 34.
Morua capelanus, *Risso, Eur. Mérid.* iii. p. 226.
Morrhua minuta, *Flem. Brit. An.* p. 191; *Yarr. Brit. Fish.* 2nd edit. ii. p. 241, 3rd edit. i. p. 544; *Thomps. Nat. Hist. Irel.* iv. p. 181.
?? Morrhua minuta, *Storer, Fisch. Massach.* p. 127; *Dekay, New York Fauna, Fish.* p. 277. pl. 44. fig. 141.

D. 12–15 | 21–22 | 20–22. A. 25–29 | 21–22.

Barbel as long as the eye; snout obtuse, not longer than the eye, with the upper jaw longest. The height of the body equals the length of the head and is one-fourth of the total (without caudal). The vent is situated vertically below the last rays of the first dorsal. Anal fins not continuous, close together; caudal truncated. The first anal is not much longer than the second dorsal. Axil without black spot.

Coasts of Europe. ? New York.

a. Half-grown: skin: not good state. Mediterranean. From Mr. Yarrell's Collection.

This species has been excellently described and figured by Fries and Ekström; another detailed description may be found in Nilsson's work.

10. Gadus luscus.

Bib, Pout, Whiting-Pout.
Asellus luscus, *Willughby,* p. 169.
—— mollis latus, *Willughb. Append.* p. 22. tab. L, M. 1. no. 4; *Ray,* p. 55.
Gadus, sp., *Artedi, Spec.* no. 6. p. 65; *Synon.* p. 37. no. 12, & p. 35. no. 5; *Gen.* p. 21. no. 6; *Gronov. Zoophyl.* no. 320.
Gadus luscus, *L. Mus. Ad. Fried.* ii. p. 60, and *Syst. Nat.* i. p. 437; *Donov. Brit. Fish.* i. pl. 19; *Jen. Man.* p. 442; *Turt. Brit. Faun.* p. 90; *Nilss. Skand. Faun.* iv. p. 545.
—— barbatus, pt., *L. Syst. Nat.* i. p. 437.
Callarias, *Klein, Pisc. Miss.* v. p. 6. no. 3.
Pout and Bib, *Penn. Brit. Zool.* iii. pp. 161, 162. pl. 30; ed. 1812, iii. pp. 246, 247. pl. 34.
Tacaud, *Duhamel, Pêches,* ii. p. 136. pl. 23. fig. 2.
Gadus barbatus, *Bl.* taf. 166; *Bl. Schn.* p. 7; *Cuv. Règne Anim.*; *Malm, Götheb. Handl.* 1851, p. 107. c. fig.
—— tacaud, *Lacép.* ii. pp. 366, 410.
—— bibus, *Lacép.* ii. pp. 365, 403.
Morhua lusca, *Flem. Brit. Anim.* p. 191.
—— barbata, *Flem. Brit. Anim.* p. 191.

Morrhua lusca, *Yarr. Brit. Fish.* 2nd edit. ii. p. 237, 3rd edit. i. p. 540; *Parn. Wern. Mem.* vii. p. 340, or *Fish. Frith of Forth*, p. 180; *Thomps. Nat. Hist. Irel.* iv. p. 181.
Gadus colias, *Gronov. Syst. ed. Gray*, p. 131.
Air-bladder: *Delaroche, Ann. Mus.* xiv. 1809, p. 279.

D. 12 | 20–22 | 19–20. A. 29–32 | 19–20. V. 6. Vert. 48.

Barbel as long as the eye; snout obtuse, with the upper jaw longest, not longer than the eye. The height of the body is more than the length of the head, and one-third of the total (without caudal). The vent is situated vertically below the anterior portion of the first dorsal. The two anal fins are subcontinuous. Caudal truncated. Proportions of the fins:—

1 D.		2 D.		3 D.		1 A.		2 A.
1	:	2·4	:	1·15	:	3·22	:	1·2

A black spot in the axil of the pectoral; caudal edged with black. Body with cross-bands during life.

British coasts to Scandinavia. Mediterranean.

a–b. Seventeen inches long: skins. Frith of Forth. From Dr. Parnell's Collection.
c–e. Adult and young: skins. Frith of Forth. From Dr. Parnell's Collection.
f–h. Young. Brighton. Presented by Mr. E. Gerrard.
i–l. Half-grown and young: skins: not in good state. England. From Mr. Yarrell's Collection.
m. Adult. England. Presented by Mr. Gerrard.
n–o. Adult: stuffed. English coast.
p. Young. Bay of Naples. Presented by S. P. Pratt, Esq.
q. Young. Sicily. Presented by W. Swainson, Esq.
r. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
s. Adult: skin.
t. Half-grown: skin. From Gronow's Collection.
u–v. Adult and half-grown: skeletons. British.

Artedi, Parnell, and Nilsson have given detailed descriptions of this species.

The *ribs* of this species are proportionally longer and stronger than in the preceding; they are firmly attached to the dilated parapophyses, and from the sixteenth vertebra they commence to coalesce entirely with those processes, joining the ribs of the other side, whereby complete rings are formed, surrounding the posterior part of the abdominal cavity. It is impossible to define the boundary between abdominal and caudal vertebræ, the abdominal cavity being continued on to the twenty-fifth vertebra, which evidently belongs to the caudal portion.

B. Lower jaw longest; teeth in the outer series of the upper jaw stronger than the others (*Boreogadus*).

11. Gadus fabricii.

Gadus æglefinus, *Fabr. Faun. Grœnl.* p. 142.
—— fabricii, *Richards. Faun. Bor.-Amer. Fish.* p. 245.

Gadus polaris, *Richards. l. c.* p. 247; *Nilss. Skand. Faun.* iv. p. 569.
—— agilis, *Reinh. Vidensk. Selsk. Afhandl.* vii. p. 126; *Nilss. l. c.* p. 568.
Merlangus polaris, *Sabine, App. Parry's First Voy.* p. 211; *Ross, App. Parry's Third Voy.* p. 110; *Richards. Last Arct. Voy.* p. 373.

D. 12–14 | 13–16 | 20–22. A. 15–17 | 20–23.

Barbel minute and sometimes entirely absent. Snout somewhat longer than the eye, with the lower jaw longest. The width of the orbit equals that of the interorbital space, and is somewhat less than one-fourth of the length of the head; body low, tail slender, caudal slightly forked. The length of the head is contained thrice and two-thirds in the total. Fins separated by interspaces. The vent is situated vertically below the anterior rays of the middle dorsal. Proportions of the fins:—

	1 D.	2 D.	3 D.	1 A.	2 A.
	11	13	16	15	17
or	8½	10	11	11½	11
or	9	13	14	15	13½
or	7	8	8½	10	8

Head, body and fins minutely dotted with black: the dots on the dorsals and on the pectoral are much crowded, so that these fins are nearly entirely black, whilst they occupy only the lower half on the anal fins.

North polar regions of the western hemisphere. Iceland.

a, b. Half-grown. Baffin's Bay. Presented by Colonel Sabine, R.E.
c. Adult. Beechey Island. Presented by Dr. Lyell.
d–f, g–h, i–k, l–m, n, o. Specimens from 3 to 8 inches long. North Polar Expeditions. From the Haslar Collection.

12. Gadus saida.

Lepechin, Nov. Comm. Acad. Scient. Petropol. xviii. 1774, p. 512. tab. 5. fig. 1; *Bl. Schn.* p. 8.

D. 10–11 | 16–17 | 20. A. 18 | 20. V. 6. Cæc. pylor. 35–40.

Barbel minute. Snout longer than the eye, with the lower jaw longest. The height of the body is less than the length of the head, and two-ninths of the total (without caudal). The vent is situated vertically below the last rays of the first dorsal. Anal fins not continuous, close together. Caudal emarginate. Proportions of the fins:—

1 D.	2 D.	3 D.	1 A.	2 A.
1·2	1·3	1	1·4	1·3

Coloration uniform.

White Sea.

Lepechin adds to his description an account of the anatomy of this species.

13. Gadus esmarkii.

Gadus minutus, *Esmark, Forh. Naturf. Möte i Christ.* 1844, p. 231.
—— esmarkii, *Nilss. Skand. Faun.* iv. p. 565.

D. 16 | 23 | 23–27. A. 26–27 | 24–28.

Barbel slender, shorter than the eye. Snout subconical, as long as the eye, with the lower jaw prominent. The height of the body is less than the length of the head, and two-ninths of the total (without caudal). The vent is situated vertically below the last rays of the first dorsal. Anal fins not continuous, close together. Caudal emarginate. The first anal is not much longer than the second dorsal. Axil of the pectoral with a black spot superiorly.

Christianiafjord.

a. Seven inches long. Norway. Presented by Dr. Esmark.

14. Gadus productus.

Merlangus productus, *Ayres, Proc. Calif. Acad.* 1855, p. 64.
? Homalopomus trowbridgii, *Girard in Proc. Acad. Nat. Sc. Philad.* 1856, p. 132, and *U.S. Pac. R.R. Exp. Fish.* p. 144. pl. 40 *a.* figs. 1–4.*

D. 11 | 22 | 18. A. 21 | 19. V. 8. L. lat. 140.

The height of the body is contained seven times and a half in the total length, the length of the head four times. Lower jaw the longest; the maxillary extending to below the centre of the eye. Eyes large, their diameter contained not quite five times in the length of the head, distant a little less than two diameters from the tip of the lower jaw; interval between the eyes a little greater than one diameter. The first dorsal is separated from the second by an interspace, whilst the second and third and the anals are close together. The second dorsal is twice and a half as long as the first, and equal in length to the first anal. Lateral line dark. (*Ayres.*)

Coast of California.

15. Gadus poutassou.

Gadus merlangus, *Risso, Ichth. Nice*, p. 115.
—— poutassou, *Risso, Eur. Mérid.* iii. p. 227.
Merlangus albus, *Yarr. Brit. Fish.* 2nd edit. ii. p. 247, 3rd edit. i. p. 551.
Gadus potassoa, *Düben, Vet. Akad. Handl.* 1844, p. 88.
Kulmund, *Esmark, Naturf. Möte i Christ.* 1844, p. 230.
Gadus melanostomus, *Nilss. Skand. Faun.* iv. p. 556.

D. 12–13 | 13–14 | 24. A. 36–38 | 24–25.

Barbel none. Lower jaw longest; teeth in the outer series strongest. Body rather slender. The vent is situated vertically before the first dorsal. Dorsal fins separated by great interspaces, the two anterior short. A black spot superiorly in the axil of the pectoral.

Coasts of Europe.

C. Lower jaw longest; teeth in the upper jaw of equal size (*Pollachius*).

16. Gadus pollachius.

Pollack.
Asellus Hvitingo-Pollachius, *Willughby*, p. 167; *Ray, Syn.* p. 53.
Gadus, sp., *Artedi, Synon.* p. 35. no. 3; *Genera*, p. 20. no. 3 (incorrect descript.).
Gadus pollachius, *L. Syst. Nat.* i. p. 439; *Bl. Fische Deutschl.* ii. p. 171. taf. 68; *Bl. Schn.* p. 10; *Lacép.* ii. p. 417; *Walb. Art.* iii. p. 127;

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* Formerly incorrectly referred to the Acanthopterygians.

Donov. Brit. Fish. i. pl. 7; *Turt. Brit. Faun.* p. 91; *Risso, Ichth. Nice,* p. 113; *Fries & Ekstr. Skand. Fisk.* p. 89. tab. 20; *Nilss. Skand. Faun.* iv. p. 562.
Callarias imberbis, no. 1, *Klein, Pisc. Miss.* v. p. 8.
Pollack, *Penn. Brit. Zool.* iii. p. 166, and edit. 1812, iii. p. 254.
Lieu, *Duhamel,* ii. sect. 1. cap. 2. p. 121. pl. 20. fig. 1.
Merlangus pollachius, *Flem. Brit. An.* p. 195; *Jen. Man.* p. 446; *Yarr. Brit. Fish.* 2nd edit. ii. p. 253, 3rd edit. i. p. 559; *Parnell, Wern. Mem.* viii. p. 347, or *Fish. Frith of Forth,* p. 187.
Gadus viridis, *Gronov. Syst. ed. Gray,* p. 133.

D. 12 | 18–20 | 17–19. A. 31 | 19–20.

Barbel none. Snout conical, nearly twice the length of the eye, with the lower jaw prominent. Teeth in the upper jaw of equal size, cardiform. The height of the body is less than the length of the head, which is contained thrice and three-fifths in the total (without caudal). The vent is situated vertically below the anterior half of the first dorsal. Anal fins separated from each other by a small interspace. Caudal truncated. Proportions of the fins:—

1 D.		2 D.		3 D.		1 A.		2 A.
1	:	2·3	:	1·5	:	3·6	:	1·6

A black spot superiorly in the axil of the pectoral.

Coasts of Europe, to the western parts of the Mediterranean.

a. Three feet long: stuffed. Frith of Forth. From Dr. Parnell's Collection.
b–d. Young: skins. Frith of Forth. From Dr. Parnell's Collection.
e. Young. Polperro. Presented by J. Couch, Esq.
f. Young. England. From Mr. Yarrell's Collection as *Gadus merlangus.*
g–h. Half-grown. Lisbon. Presented by the Rev. R. T. Lowe.
i. Young.

We are indebted to Parnell, Nilsson, Fries and Ekström for descriptions, and to the latter for a very good representation of this species.

17. **Gadus virens.**

Coal-fish.
Piscis Colfish Anglorum, *Bellon. De Aquat.* p. 133; *Gesner,* p. 89.
Asellus niger carbonarius, *Schonev.* p. 19; *Aldrov.* iii. cap. 7. p. 289; *Willughby,* p. 168. tab. L, M. 1. no. 3; *Ray,* p. 54.
Gadus, sp., *Artedi, Synon.* p. 34. no. 2; *Genera,* p. 20. no. 2; *Gronov. Zoophyl.* nos. 317 & 318.
Gadus virens, *L. Syst. Nat.* i. p. 438, and *Faun. Suec.* p. 112; *Bl. Schn.* p. 6; *Nilss. Skand. Faun. Fisk.* iv. p. 559.
—— carbonarius, *L. Syst. Nat.* i. p. 438; *Bl. Fische Deutschl.* ii. p. 164. taf. 66; *Bl. Schn.* p. 9; *Donov. Brit. Fish.* i. pl. 13; *Turt. Brit. Faun.* p. 91; *Richards. Faun. Bor.-Amer. Fish.* p. 247; *Faber, Fische Isl.* p. 96; *Brandt & Ratzeb.* i. p. 51. tab. 9. fig. 1; *Fries & Ekstr. Skand. Fisk.* p. 195. taf. 48; *Gronov. Syst. ed. Gray,* p. 132.
Callarias imberbis, no. 2, *Klein, Pisc. Miss.* v. p. 8.
Coal-fish, *Penn. Brit. Zool.* iii. p. 164. pl. 31, and edit. 1812, iii. p. 250. pl. 35.
Green Cod, *Penn. Brit. Zool.* 1812, iii. p. 253.
Colin, *Duhamel, Poiss.* ii. p. 125. tab. 21. fig. 1.

Ascan. iii. tab. 23.
Gadus colinus, *Lacép.* ii. p. 416.
—— sey, *Lacép.* ii. p. 417.
Merlangus virens, *Flem. Brit. An.* p. 195; *Jen. Man.* p. 447; *Yarr. Brit. Fish.* 2nd edit. ii. p. 256, 3rd edit. i. p. 557; *Parn. Wern. Mem.* vii. p. 349, or *Fish. Frith of Forth,* p. 189; *Reinh. in Dansk. Vidensk. Selsk. Afhandl.* vii. p. 128.
—— carbonarius, *Flem. Brit. An.* p. 195; *Jen. Man.* p. 446; *Yarrell, Brit. Fish.* 2nd edit. ii. p. 250, 3rd edit. i. p. 554; *Parn. Wern. Mem.* vii. p. 345, or *Fish. Frith of Forth,* p. 185; *Storer, Fish. Massach.* p. 129; *Dekay, New York. Faun. Fish.* p. 287. pl. 45. fig. 144; *Thomps. Nat. Hist. Irel.* iv. p. 183.
Gadus pollachius, *Gronov. Syst. ed. Gray,* p. 133.

D. 13 | 20–22 | 20–22. A. 24–27 | 21–23. Vert. 54.

Barbel none or rudimentary. Snout conical, much longer than the eye, with the lower jaw prominent. Teeth in the upper jaw of equal size, cardiform. The height of the body is less than the length of the head, which is contained thrice and three-fifths in the total (without caudal). The vent is situated vertically below the last rays of the first dorsal. Anal fins separated from each other by an interspace. Caudal truncated. Proportions of the fins:—

1 D. 2 D. 3 D. 1 A. 2 A.
1 : 2·2 : 1·3 : 2·5 : 1·3

A black spot superiorly in the axil.

North Atlantic, southwards to 46° L.W. Northern coasts of Europe.

a. Half-grown: skin. England. From Mr. Yarrell's Collection.
b–g. Adult and young: skins. Frith of Forth. From Dr. Parnell's Collection.
h. Forty-one inches long: stuffed. Polperro.
i. Young. Frith of Forth. Museum Leach.
k, l. Half-grown and young. Båhuslän. Presented by Hr. A. W. Malm.
m. Adult: stuffed. North America. Presented by E. Doubleday, Esq.
n. Half-grown. Boston. Presented by B. Winstone, Esq.—Barbel minute.
o. Half-grown: skin. From Gronow's Collection.
p. Adult: skeleton. British.

Parnell, Nilsson, Fries and Ekström have given detailed descriptions of the Coal-fish, and the two latter a very good figure.

The transverse processes of the abdominal *vertebræ* are rather short, the ribs relatively feeble. The interhæmals of the anterior half of the first anal are free between the abdominal muscles. The abdominal cavity terminates below the twenty-seventh vertebra.

18. Gadus chalcogrammus.

Pall. Zoogr. Ross.-As. iii. p. 198.

D. 13 | 15 | 20. A. 21 | 22. Vert. 52.

Snout broad, depressed, rather obtuse. "Dentes aciculares in maxillis." Barbel none. Eyes large. Caudal forked. Sides with two interrupted brown longitudinal bands. (*Steller.*)

Kamtschatka.

2. GADICULUS.

Gadiculus, *Guichen. Explor. Algér. Poiss.* p. 101.

Body moderately elongate, covered with scales of moderate size. Eye large. A separate caudal; three dorsal and two anal fins; ventrals composed of several rays. Cleft of the mouth oblique, with the lower jaw rather longer than the upper. Jaws with a narrow band of small teeth; vomer and palatines smooth. Branchiostegals seven.

Mediterranean.

1. Gadiculus argenteus.

Guichen. l. c. p. 102. pl. 6. fig. 2.

Barbel none. The first anal is rather longer than the other fins. The vent is situated in the vertical from the last rays of the soft dorsal. (*Guich.*)

Coast of Algiers.

We refer, for the present, the following species to this genus:—

2. Gadiculus blennioides.

Gadus blennioides, *Pall. Spicil.* viii. p. 47. tab. 5. fig. 2.

D. 10–11 | 17 | 16. A. 23 | 19. V. 5.

A barbel at the chin. The length of the head is nearly one-fourth of the total (without caudal); the diameter of the eye is contained three times and a half in the length of the head. Teeth in the jaws of unequal size. The vent is situated vertically below the first dorsal. Each ventral is composed of a long ray, bifid at its end, and of four other very small ones. Silvery, greyish on the back. (*Pall.*)

Mediterranean.

3. MORA.

Mora, *Risso, Eur. Mérid.* iii. p. 224.
Asellus, *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 76.
Pharopteryx, *Rüpp. Verzeichn. Mus. Senckenb. Fische,* p. 16.

Body moderately elongate, covered with scales of moderate size. A separate caudal; two dorsal and two anal fins; ventrals composed of six rays. Teeth small, cardiform, of equal size, in the upper jaw in a band; teeth on the vomer and sometimes on the palatine bones. Branchiostegals seven.

Mediterranean. Canary Islands.

1. Mora mediterranea.

Gadus moro, *Risso, Ichth. Nice,* p. 116.
Mora mediterranea, *Risso, Eur. Mérid.* iii. p. 224; *Bonap. Faun. Ital. Pesce*; *Lowe, Proc. Zool. Soc.* 1843, p. 91.

Asellus canariensis, *Valenc. l. c.* pl. 14. fig. 3 (bad).
Pharopteryx benoit, *Rüpp. l. c.* (young).

D. 7–8 | 42–44. A. 16–18 | 17. V. 6. L. lat. 95. Vert. 51.

Barbel slender, much shorter than the eye. Inside of mouth black. Both anals below the posterior two-thirds of the dorsal. Caudal forked.

Mediterranean. Canary Islands. Madeira.

a. Young: Mediterranean. Presented by Dr. E. Rüppell (*Pharopteryx benoit*).
b. Half-grown: skin. Mediterranean. From the Collection of the Zoological Society.
c. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.
d. Skeleton: twenty-two inches long. Madeira. Presented by J. Y. Johnson, Esq.

I have not been able to convince myself that these specimens belong to different species. The large individuals from Madeira have a small but very distinct patch of short cardiform teeth on the anterior end of the palatine bones. These teeth are absent in the smaller specimen from the Mediterranean, which in other respects perfectly agrees with the Madeira fish, as far as it can be determined from a single skin. If it should prove to be specifically distinct, the name of *Mora benoit* may be applied to it, as *Pharopteryx benoit* is merely the young state of that fish. The typical specimens of *Ph. benoit* are from 10 to 18 lines long.

The *skeleton* does not differ from that of *Gadus*, except in those points which are dependent on the general external form. The transverse processes of the abdominal vertebræ are elongate, although shorter than the neural spines, and but slightly dilated; the ribs are feeble. The abdominal cavity is continued on to below the anterior caudal vertebræ, terminating below the twenty-fifth vertebra.

4. HALARGYREUS.

Body elongate, covered with small scales. (A separate caudal); two dorsal and two anal fins, the latter subcontinuous; ventrals composed of several rays. Jaws with a band of minute villiform teeth of equal size; no teeth on the vomer or the palatine bones. No barbel. Branchiostegals seven; pseudobranchiæ glandular, rudimentary, covered by the membrane; gill-rakers of the outer branchial arch long.

Madeira.

1. Halargyreus johnsonii.

D. 7 | . . . A. 17 | . . . V. 5.

Eight series of scales between the anterior dorsal and the lateral line.

Madeira.

a. Presented by J. Y. Johnson, Esq.

Description.—The specimen on which I have founded this new genus was found in the stomach of a very fine specimen of *Saccopharynx*, procured and presented to the Museum by Mr. J. Y. Johnson, a gentleman to whom science is indebted for very valuable additions to our knowledge of the marine fauna of Madeira. The posterior part of the tail is broken off, or was digested in the stomach of its destroyer. There can be little doubt that it was provided with a separate caudal, as in the allied genera *Haloporphyrus* and *Mora*.

The head is rather elongate and compressed, its length being equal to the distance between the vent and the root of the ventrals; it is much higher than broad, its greatest height being more than one-half of its length. The snout is obtusely conical, a little longer than the diameter of the eye, which is one-fourth of the length of the head. Cleft of the mouth wide, the maxillary extending beyond the vertical from the middle of the eye. Upper jaw without lip, that of the lower very thin; the lower is received within the upper, both being equal in length anteriorly. A small bony tubercle, pointing obliquely forwards and downwards, occupies the lower part of the symphysis of the mandibles. The upper and lower jaws are armed with a narrow band of minute villiform teeth of equal size. The interorbital space is flattish, and its width rather less than the vertical diameter of the orbit. Præoperculum rounded; operculum and suboperculum each terminating in a very small spine—both spines close together.

Branchiostegals seven; gill-openings very wide, the gill-membranes scarcely united below the anterior third of the orbit; gills four, a cleft behind the fourth; the first branchial arch is provided anteriorly with long gill-rakers, longer than the lamellæ of the gills.

The greatest depth of the trunk is equal to the distance between the anterior margin of the orbit and the end of the operculum. The anterior dorsal commences immediately behind the vertical from the root of the pectoral, and is composed of very slender simple and articulated rays, the anterior of which is the longest, half as long as the head. The second dorsal commences immediately behind the first, and is not much lower, its base being covered by a thin scaly membrane. The vent is situated in the vertical from the ninth ray of the second dorsal, and the anal commences immediately behind it. The fourth to seventh rays are the longest, the posterior decreasing in length to the seventeenth, after which four or five short rays follow, preceding the stronger rays of the second anal. Base of the pectoral narrow, its length being more than one-half of the length of the head; ventrals very narrow, with flat base, the outer ray being produced into a very fine filament of moderate length.

The scales extend forward on the snout.

The colour appears to have been a delicate red on silvery ground; pectoral and anal transparent. Mouth and gill-cavity black.

This is a deep-sea fish like *Saccopharynx*; the stomach of the specimen was forced up into the mouth.

	inches.	lines.
Distance of the end of the snout from the extremity of the operculum	2	5

	inches.	lines.
Distance of the end of the snout from the origin of the first dorsal	2	8
——— from the origin of the second dorsal	3	6
——— from the vent	4	4
——— from the origin of the second anal .	6	8

5. STRINSIA.

Strinsia, *Rafin. Ind. Itt. Sic.* p. 12.

Body moderately elongate, covered with small scales; eye rather large. One short anterior dorsal, the second and the anal united with the caudal; ventral composed of several rays, rather narrow. Upper jaw overlapping the lower; both jaws with a band of small teeth and with an outer series of larger ones; no teeth on the vomer or the palatine bones. (Barbel none.)

Mediterranean.

1. Strinsia tinca.

Strinsia tinca, (*Rafin.*) *Bonap. Faun. Ital. Pesce.*

1 D 10. 2 D.+C.+A. 111. V. 7.

The maxillary extends to below the posterior margin of the eye; the origin of the anal is situated vertically below the end of the first dorsal.

Mediterranean.

6. MERLUCCIUS *.

Gadus, sp., *Artedi.*
Merluccius, sp., *Cuv. Règne Anim.*

Body elongate, covered with very small scales. A separate caudal; two dorsal fins and one anal; ventrals well developed, composed of seven rays. Teeth in the jaws and on the vomer rather strong, in double or triple series. No barbel. Branchiostegals seven.

Temperate seas of Europe, to the coasts of North America; one species from Chile.

1. Merluccius vulgaris.

Hake.
Ὄνος, *Aristot.* viii. c. 15, ix. c. 37; *Athen.* vii. 315; *Ælian,* ix. c. 38; *Oppian, Hal.* i. p. 5, and ii. p. 59.
Ὄνος θαλάττιος, *Ælian,* v. c. 20.
Marlutius, *Bellon. De Aquat.* p. 122; *Gesner,* pp. 84, 97.
Asellus, *Ovid,* v. 131; *Plin.* ix. c. 16, 17; *Rondel.* ix. c. 9, p. 272; *Salv.* p. 73. c. fig. mal.
Asellus alter, *Aldrov.* iii. c. 2. p. 286.
—— primus, *Willughby,* p. 174. tab. L, M. 2. no. 1; *Ray,* p. 56.
Gadus, sp., *Artedi, Syn.* p. 36. no. 10; *Genera,* p. 22. no. 8; *Gronov. Zoophyl.* no. 315.
Lysing, *Ström, Söndm.* i. p. 295.
Gadus merluccius, *L. Syst. Nat.* i. p. 439; *Fabr. Faun. Grœnl.* p. 148; *Bl. Ausl. Fische,* ii. p. 94. taf. 164; *Bl. Schn.* p. 10; *Lacép.* ii. p. 446;

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* 1. Merluccius ambiguus, *Lowe, Proc. Zool. Soc.* 1840, p. 37.—Madeira.
2. Gadus fimbria, *Pall. Zoogr. Ross.-As.* iii. p. 200.—N.W. coast of America.

Brünn. Pisc. Mass. p. 20; *Donov. Brit. Fishes*, ii. pl. 28; *Turt. Brit. Faun.* p. 91; *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 371.
Hake, *Penn. Brit. Zool.* iii. p. 168, and edit. 1812, iii. p. 257.
Grand Merlus, *Duham. Pêches*, ii. sect. 1. cap. 7. p. 141. tab. 24.
Gadus merlus, *Risso, Ichth. Nice*, p. 122.
Merluccius vulgaris, *Flem. Brit. An.* p. 195; *Jen. Man.* p. 447; *Yarr. Brit. Fishes*, 2nd edit. ii. p. 258, and 3rd edit. i. p. 562; *Parn. Wern. Mem.* vii. p. 350, or *Fishes Frith of Forth*, p. 190; *Storer, Fishes Massach.* p. 132; *Nilss. Skand. Faun.* iv. p. 570; *Lowe, Trans. Zool. Soc.* ii. p. 189, and *Proc. Zool. Soc.* 1843, p. 90; *Thomps. Nat. Hist. Irel.* iv. p. 184.
Stomodon bilinearis, *Mitch. Rep. Fish. New York*, p. 7.
Merluccius esculentus, *Risso, Eur. Mérid.* iii. p. 220.
—— argentatus, *Fries & Ekstr. Skand. Fisk.* p. 145. tab. 33.
Kummel, *Holb. Götheb. Nya Handl.* v. p. 38. c. fig.; *Schagerstr. Phys. Sällsk. Tidskr.* 1838, p. 302.
Merluccius sinuatus, (*Swains.*) *Lowe, Proc. Zool. Soc.* 1840, p. 38, and *Trans. Zool. Soc.* iii. p. 15.
Merlucius lanatus, *Gronov. Syst. ed. Gray*, p. 130.
—— albidus, (*Mitch.*) *Dekay, Fauna New York, Fishes*, p. 280. pl. 46. fig. 148 (bad).
Air-bladder: *Delaroche, Ann. Mus.* xiv. 1809, p. 279.

D. 10 | 36–37. A. 36–37. V. 7. Vert. 25/26.

Teeth in both jaws strong and long. The posterior parts of the dorsal and anal fins are elevated, higher than the anterior. Inside of mouth black.

Coasts of Europe and North America.

a. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
b. Fine specimen. London market.
c. Half-grown: stuffed. Frith of Forth.
d, e. Adult: stuffed. English coast.
f. Half-grown: skin. From Mr. Yarrell's Collection as *Gadus merlangus.*
g. Young: very bad state (*Epicopus gayi*).
h–i. Large skeletons. British.

The *skull* does not differ in its structure from that of *Gadus*, except in those points which are dependent on the general external form, whilst the vertebral column is so peculiarly modified that it may be easily distinguished from all the other Gadoids. Its abdominal portion terminates with the twenty-fifth vertebra, and is shorter than the caudal portion. The neural spines of all the abdominal vertebræ are extremely strong, dilated, one wedged into the other: the first, however, is quite free, erect, whilst the others are inclined backwards. The parapophyses of the third to sixth vertebræ are slender, styliform, like the processes of the vertebræ of a frog. The transverse processes of all the following abdominal vertebræ are long, very broad, nearly touching each other, convex on the upper side and concave on the lower; the two or three anterior pairs are, as it were, inflated. The whole forms a strong roof for the abdominal cavity, and particularly for the air-bladder, and reminds us of a similar structure in *Kurtus*.

2. Merluccius argentatus.

Gadus merluccius (argentatus), *Faber, Fische Isl.* p. 90.

D. 15 | 43. A. 51 $\left(\frac{28}{23}\right)$.

Teeth in both jaws strong and long. The second dorsal and the anal are deeply notched on the middle, the parts being continued by some short free rays. Inside of the mouth whitish.

Iceland.

We have not had an opportunity of examining an Iceland Hake, but the characters given by Faber appear to be sufficient to consider it as a species distinct from the common Hake of Europe.

3. Merluccius gayi.

Merlus gayi, *Guichen. in Gay, Hist. Chil. Zool.* ii. p. 328, *Ictiol.* lam. 8. fig. 2.

Teeth in the upper jaw rather small; the posterior rays of the dorsal and anal are the shortest.

Coast of Chile.

The specimen which I at one time considered as belonging to this species, may be, after all, merely a young Hake; it is in a very bad state of preservation, and without any indication of the locality whence it has been procured. The simple structure of the rays of the first dorsal appears to be peculiar to the young state. The roughnesses on the palatine bones were caused by calcareous deposits (the specimen was preserved in chloride of zinc), but there are no true teeth. The genus *Epicopus*, therefore, must be erased from the ichthyological system (vol. ii. p. 248).

7. LOTELLA.

Lotella, *Kaup in Wiegm. Arch.* 1858, p. 88.

Body of moderate length, covered with small scales. A separate caudal; two dorsal fins and one anal; ventral fins with a flat base, and composed of several rays. Teeth in the upper jaw in a band, with an outer series of larger ones. Vomerine or palatine teeth none. Chin with a barbel. Branchiostegals seven (six?).

Japan. New Zealand.

1. Lotella phycis.

Lota phycis, *Schleg. Faun. Japon. Poiss.* p. 248. pl. 111. fig. 1.
Lotella schlegelii, *Kaup, l. c.*

B. 6. D. 5 | 59. A. 51. V. 9.

The two outer ventral rays produced into filaments. The height of the body equals the length of the head, and is two-ninths of the total. Head as broad as high. Snout short, obtuse, its length being less than the diameter of the eye, or two-ninths of the length of the head; it equals the width of the interorbital space. Upper jaw overlapping the lower. Barbel one-third of the length of the head.

Japan.

2. Lotella rhacinus.

Gadus rhacinus, *Forst. Descr. Anim. ed. Licht.* p. 304.
Phycis tinca, var., *Bl. Schn.* p. 56.

B. 7. D. 5 | 68. A. 62. V. 6.

Ventral fins pointed, thick. The height of the body is one-fourth of the total length, the length of the head two-ninths. Upper jaw longer than the lower. Uniform blackish.

Queen Charlotte's Sound (New Zealand).

3. Lotella fuliginosa.

D. 9 | 50. A. 54. V. 9.

The two outer ventral rays produced into filaments. Uniform brown; fins blackish; ventral filaments white.

Hab. —— ?

a. Eight inches long. From the Haslar Collection.

Description of the specimen.—Head rather short and broad; its length is one-fourth of the total, and its depth nearly equal to its width. The snout is rather short and obtuse, equal in length to the diameter of the eye, which is two-ninths of the length of the head. The upper jaw overlaps the lower, and the maxillary extends beyond the vertical from the middle of the eye. Barbel rather longer than the eye. Nostrils close together, immediately in front of the eye. Interorbital space flat, its width being equal to the vertical diameter of the orbit. The teeth in the upper jaw form a band, with an outer series of widely-set stronger teeth. Lower jaw armed with a single series of teeth, equal in size to those of the outer series of the upper jaw. Operculum obtusely rounded behind. Branchiostegals seven. Gill-membranes attached to the isthmus.

Body and tail compressed; the latter tapering posteriorly, so that its least depth is equal to one diameter of the eye. The dorsal fins are close together, of equal height, and, like the anal, enveloped in a scaly membrane: the anterior commences vertically above the root of the pectoral, and the posterior terminates at a short distance from the caudal. The vent is in the vertical from the fifth ray of the second dorsal. Caudal rounded. The length of the pectoral equals the distance of the middle of the orbit from the margin of the operculum. Ventral inserted at some distance in front of the pectoral, with flat base, and with the filamentary ray extending nearly to the vent.

The scales are very small, and on the head minute, the snout being naked.

4. Lotella bacchus.

Gadus bacchus, *Forst. Descr. Anim. ed. Licht.* p. 120.
Enchelyopus bachus, *Bl. Schn.* p. 53.

B. 7. D. 10 | 42. A. 40. V. 6.

Ventral fins pointed. The length of the head is one-fourth of the total (without caudal), the height of the body rather more than one-fifth. Jaws subequal anteriorly. Uniform reddish-olive.

Southern parts of New Zealand.

8. PHYSICULUS.

Physiculus, *Kaup in Wiegm. Arch.* 1858, p. 88.

Body elongate, covered with small scales. A separate caudal; two dorsal fins and one anal; ventral fins with a very narrow but flat base, composed of several rays. Teeth in the jaws in a band, small, villiform, of equal size; vomerine or palatine teeth none. Chin with a barbel. Branchiostegals seven; gill-rakers of the outer branchial arch short.

Madeira.

1. Physiculus dalwigkii.

Kaup, l. c.

D. 7 | 67. A. 69. V. 5.

Eleven series of scales between the anterior dorsal and the lateral line. Axil of the pectoral black.

Madeira.

a. Eight and a half inches long. Presented by the Rev. R. T. Lowe, as *Merlucius maraldi*.

Description.—Head rather broad and depressed, as high as broad; its height is more than one-half of its length, which is one-fourth of the total (without caudal). The cleft of the mouth is rather oblique, of moderate width, the maxillary extending behind the vertical from the centre of the eye. The upper jaw overlaps the lower, and both are armed with a band of villiform teeth of equal size. Snout rather broad, obtusely rounded, as long as the diameter of the eye, which is one-fourth of the length of the head. Chin with a small barbel half as long as the eye. The interorbital space is flat, emarginate on each side by the upper part of the orbit, its width being rather less than the vertical diameter of the eye. Nape of the neck broad, scarcely elevated, with a spine on each side, pointing outwards and covered by skin. The operculum terminates in a short horizontal spine. Gill-opening wide; gill-membranes united below the throat by a narrow cutaneous bridge, not attached to the isthmus; gills four, pseudobranchiæ none.

The trunk is rather low, its greatest depth being contained five times and a third in the total (without caudal). Tail tapering into a very narrow band. The first dorsal fin commences vertically above the root of the pectoral and is nearly twice as high as long, the length of the longest ray being one-half of that of the head. The second dorsal commences immediately behind the first; its height is nearly equal throughout its extent, and somewhat less than that of the first. The whole fin is naked. Caudal fin slender, rounded, entirely free from dorsal and anal, not half as long as the head. The anal fin commences at some distance behind the vent, which is situated vertically below the root of the pectoral; it is very similar to the second dorsal, but lower. The pectoral is inserted on the middle of the body, and its length is two-thirds of that of the head. Ventrals very narrow, slender, with the outer ray produced into a filament, which does not extend to the origin of the anal.

The scales extend over the whole head, the thin lips being naked.

Uniform brownish; pectoral and anal whitish; axil, chin and belly blackish; inside of mouth white.

9. URALEPTUS.

Uraleptus, *Costa* (*Wiegm. Arch.* 1858, p. 87).

Body elongate, compressed and tapering posteriorly, covered with small scales. A separate caudal; two dorsal fins and one anal; ventral fins narrow, with flat base, composed of six rays. Upper and lower jaw with an outer series of strong curved teeth. Vomerine and palatine teeth none. Chin without barbel. Branchiostegals seven.

Mediterranean and the neighbouring parts of the Atlantic.

1. Uraleptus maraldi.

Gadus maraldi, *Risso, Ichth. Nice*, p. 123. pl. 6. fig. 13.
Merlucius maraldi, *Risso, Eur. Mérid.* iii. p. 220.
—— attenuatus, *Cocco.*
Uraleptus maraldi, *Costa, Faun. Napol.* pl. 37*a*.
Gadella gracilis, *Lowe, Proc. Zool. Soc.* 1843, p. 91.*

D. 10 | 55–58. A. 56–62. V. 6. L. lat. ca 120.

Jaws of equal length. Eight series of scales between the first dorsal and the lateral line.

Mediterranean. Madeira.

a. Adult: skin. Mediterranean. From Mr. Yarrell's Collection.
b–c. Adult. Madeira. Presented by J. Y. Johnson, Esq.

Description.—The head is rather thick, its greatest width being equal to its height, which is somewhat more than one-half of its length; its length is one-fourth of the total (without caudal). The cleft of the mouth is oblique, wide, the maxillary extending to below the posterior margin of the orbit. The lower jaw is received within the upper, but both are nearly equal in length anteriorly; they are armed with a series of rather large, curved, widely set teeth, and there is another series of small teeth within the outer in the upper jaw. Snout rather broad, obtusely rounded, scarcely longer than the eye, the diameter of which is two-ninths of the length of the head. The interorbital space is emarginate on each side by the upper part of the orbit, and its width is somewhat more than the diameter of the eye. Nape of the neck broad, scarcely elevated, with a spine on each side, pointing outwards and covered by skin. Operculum small, with a slender horizontal spine posteriorly, the part below the spine being deeply emarginate. Gill-membranes united below the throat by a rather narrow cutaneous bridge, not attached to the isthmus. Gill-opening wide; gills four, a slit behind the fourth; pseudobranchiæ glandular. The trunk is rather low, its greatest depth being one-sixth of the total (without caudal); tail tapering into a very narrow band. The first dorsal fin commences behind the vertical from the base of the pectoral, is somewhat higher than long, and not higher than the second. The second dorsal commences immediately behind the first; its rays increase somewhat in length posteriorly, one of the longest being half as long as the head. The whole fin is naked. Caudal fin slender, slightly rounded, entirely free from dorsal and anal, and nearly half as long as the head. The anal fin commences at some distance behind the vent, which is situated vertically below the origin of the first dorsal; it is very similar to the second dorsal. The pectoral is inserted somewhat below the middle of the body, and its length equals the distance between the front margin of the eye and the end of the operculum. Ventrals narrow, slender, with the outer ray produced into a filament, shorter than the pectoral.

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* I have examined the typical specimen of *Gadella gracilis*, which is preserved in the Collection of the Philosophical Society of the University of Cambridge. It belongs to this species, and has two dorsal fins,—Mr. Lowe probably having taken the natural interspace between the two fins as an accidental rent. (See also p. 348.)

The scales extend over the whole head, the chin and the thin lips being naked.

Uniform brownish; fins blackish; pectorals transparent. Inside of the mouth and of the gill-opening white; chin black.

The largest of the specimens is 9 inches long.

10. PSEUDOPHYCIS.

Body of moderate length, covered with rather small scales. A separate caudal; two dorsal fins and one anal; ventral fins with an exceedingly narrow styliform base, but composed of several rays. Teeth in the jaws in a band, of equal size; vomerine or palatine teeth none. Chin with a barbel. Branchiostegals seven.

New Zealand.

1. Pseudophycis breviusculus.

Lota breviuscula, *Richards. Voy. Ereb. & Terr. Fish.* p. 61. pl. 38. fig. 1.

D. 8 | 46. A. 50. V. 5. L. lat. 85.

The ventral fin does not extend to the vent. Seven or eight series of scales between the anterior dorsal and the lateral line.

New Zealand.

a. Seven inches long. New Zealand. From the Haslar Collection. —Type of the species.

b. Four inches long. New Zealand. Presented by Capt. Drury.

Description.—The height of the body equals the length of the head, and is a little less than one-fourth of the total (without caudal). Head as broad as high, its greatest width being three-quarters of its length. Head scaly, except the foremost part of the snout, which is naked. Interorbital space flat, its width being equal to the diameter of the eye, which is one-fourth of the length of the head. Snout broad, obtuse, rounded, not longer than the eye, with the upper jaw overlapping the lower. Cleft of the mouth rather oblique, the maxillary not extending to the hinder margin of the eye. Barbel as long as the eye. Teeth in the jaws villiform, of equal size, forming bands. Vomer smooth. Nostrils immediately before the eye. Operculum rounded, without point. Seven branchiostegals; gill-membranes united by a narrow cutaneous bridge; four gills, a slit behind the fourth; pseudobranchiæ small, glandular. Dorsal fins of equal height, and, like the anal, enveloped in a scaly membrane; the anterior commences behind the vertical from the base of the pectoral, the posterior in the same vertical with the anal. Caudal rounded, entirely free from dorsal and anal. Pectoral rather short, its length being equal to the distance between the posterior margin of the orbit and the extremity of the operculum. Ventral fins exceedingly narrow, as in *Phycis*, and inserted anteriorly at the throat, but composed of five slender rays, which are enveloped by a common membrane at the base, the two outer rays being the strongest, and the second the longest, but shorter than the head; the three inner rays are very thin, and only their tips are visible externally.

Brownish; vertical fins with a darker edge.

11. PHYCIS[*].

Phycis, sp., et Enchelyopus, sp., *Bl. Schn.*
Phycis, *Cuv. Règne Anim.*

Body of moderate length, covered with small scales. Fins more or less enveloped in a loose skin. A separate caudal; two dorsal fins and one anal; the anterior dorsal composed of eight to ten rays; ventrals reduced to a single long ray, bifid at its end. Small teeth in the jaws and on the vomer; vomerine teeth in an angular band; none on the palatine bones. Chin with a barbel. Branchiostegals seven.

Temperate parts of the North Atlantic. Mediterranean.

1. Phycis blennioides.

? Φυκὶς, *Aristot.* viii. c. 30.[†]
? Phycis, *Plin.* ix. c. 26, xxxii. c. 11.[†]
Phycis, *Rondel.* vi. c. 10. p. 186; *Gesner*, pp. 718, 845; *Aldrov.* i. c. 8. p. 43; *Jonston*, i. tit. 2. cap. 1. art. 6. tab. 14. no. 4; (not *Salv.*).
Barbus major, *Jago in Ray, Syn.* p. 163. fig. 7.

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[*] 1. Batrachoides gmelini, *Risso, Ichth. Nice*, p. 143. pl. 6. fig. 16, and *Eur. Mérid.* iii. p. 223.
2. Phycis dekayi, *Kaup in Wiegm. Arch.* 1858, p. 89.—North America.
3. Gadus tenuis, *Mitch. Lit. & Phil. Trans. New York*, i. p. 372.—North America.

[†] It is probable that the ancients assigned this name to a Goby.

Forked Hake, *Penn. Brit. Zool.* iii. p. 170. pl. 31, and edit. 1812, iii. p. 259. pl. 35.
Gadus blennoides, *Brünn. Ichth. Mass.* p. 24.
Merlu barbu, *Duham. Pêches,* ii. p. 147. pl. 25. fig. 4.
Gadus bifurcus, *Walb. Art.* iii. p. 137.
—— albidus, *L. Gm.* i. p. 1171.
Phycis tinca, *Bl. Schn.* p. 56. tab. 11.
—— blennoides, *Bl. Schn.* p. 56; *Risso, Eur. Mérid.* iii. p. 222; *Cuv. Règne Anim.*
Blennius gadoides, *Risso, Ichth. Nice,* p. 136.
Greater Forked Beard, *Couch in Linn. Trans.* xiv. p. 75.
Blennius phycis, *Turton, Brit. Faun.* p. 93.
Phycis furcatus, *Flem. Brit. An.* p. 193; *Jen. Man.* p. 452; *Yarr. Brit. Fish.* 2nd edit. ii. p. 289, and 3rd edit. i. p. 595; *Thomps. Nat. Hist. Irel.* iv. p. 187.

D. (9) 10 | 58–62. A. 54. L. lat. 100.

The first dorsal with some of the anterior rays elongate; the ventral extends far beyond the origin of the anal. Five or six series of scales between the anterior dorsal and the lateral line. Vertical fins edged with black; ventrals white.

Coasts of Europe.

a. Adult: stuffed. Liverpool. Presented by J. P. G. Smith, Esq.
b. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
c. Adult: stuffed. Polperro. Purchased.
d. Adult: skin. From Mr. Yarrell's Collection.
e, f. Half-grown: skins.
g. Large specimen ($29\frac{1}{2}$ inches long). Madeira. Presented by J. Y. Johnson, Esq.
h. Young. Sicily. Presented by W. Swainson, Esq.

Description.—The height of the body is less than the length of the head, which is one-fourth of the total length (without caudal). Snout obtuse, rounded, with the upper jaw overlapping the lower, nearly as long as the eye. Cleft of the mouth subhorizontal, the maxillary not quite extending to the vertical from the posterior margin of the eye. Teeth villiform, in a band in the jaws and on the vomer. Barbel nearly as long as the eye; a very short cutaneous flap at the nostril. The width of the interorbital space equals that of the orbit in adult specimens, whilst it is much less in young ones. The anterior dorsal commences in the vertical from the pectoral; its second and third rays are prolonged, but shorter than the head. The second dorsal and the anal are enveloped in a somewhat loose skin, which is scaly at the base; their margins are even. Caudal entirely free from dorsal and anal, subtruncated in large individuals and rounded in young ones. The vent is situated below the ninth ray of the second dorsal, and the anal commences immediately behind it. Pectoral much shorter than the head. The longer of the two filaments, into which the ventral is divided, extends sometimes nearly to the middle of the anal. Pseudobranchiæ none.

Body immaculate; all the fins edged with black.

This species grows to a length exceeding 2 feet.

2. Phycis americanus.

Chuss, *Schoepf in Schrift. Gesellsch. Ntrf. Freunde Berlin,* viii. p. 143.
Enchelyopus americanus, *Bl. Schn.* p. 53.
Gadus longipes, *Mitch. Trans. Lit. & Phil. Soc. New York,* i. p. 372. pl. 1. fig. 4.
Phycis furcatus, *Storer, Bost. Journ. Nat. Hist.* i. p. 418.
—— americanus, *Storer, Fish. Massach.* p. 138; *Dekay, New York Faun. Fish.* p. 291. pl. 46. fig. 150.

D. 10 | 52–54. A. 48–50.

The first dorsal with some of the anterior rays elongate; the ventral extends beyond the origin of the anal. Barbel very small. Anal with blackish margin.

Coasts of North America, northwards of New York.

3. Phycis rostratus.

D. 9 | 59-62. A. 49–50. L. lat. ca 150.

The first dorsal with some of the rays elongate; the ventral extends to the origin of the anal. Ten series of scales between the anterior dorsal and the lateral line. Ventral fins immaculate.

Hab. ——?

a, b. Eight inches long.

Description.—These specimens ought, perhaps, to be referred to *Ph. americanus,* but that species appears to have considerably longer ventral fins, at least according to the descriptions given of it. *Ph. dekayi,* briefly noticed by Kaup, is stated to have the body more elevated than *Ph. americanus,* and the ventrals nearly or quite twice as long as the head.

The height of the body is one-fifth of the total length (without caudal), the length of the head one-fourth. Snout protruding, subconical but somewhat depressed, longer than the diameter of the eye, which is two-ninths of the length of the head. Cleft of the mouth horizontal, with the upper jaw projecting much beyond the lower, and with the maxillary extending to below the posterior margin of the eye. Teeth cardiform, forming bands in the jaws and on the vomer. Barbel very short and slender. The width of the bony interorbital space equals the vertical diameter of the orbit; operculum terminating in a short pungent spine. The snout and the jaws are naked, the remainder of the head being covered with small scales.

The vent is situated below the eighth or eleventh rays of the second dorsal, and the anal fin commences immediately behind it. Fins enveloped in a rather loose scaly membrane. The first dorsal commences behind the base of the pectoral; its third ray is the longest, but considerably shorter than the head. The margins of the second dorsal and anal are even; caudal rounded, entirely free from dorsal and anal. The length of the pectoral is three-quarters of that of the head; ventral not much longer than the head.

The coloration appears to have been uniform.

4. Phycis brasiliensis.

Kaup in Wiegm. Arch. 1858, p. 88.

D. 8 | 57. A. 50.

The first dorsal is pointed and higher than the second, its third ray being as long as the head. The ventral twice, or nearly twice, as long as the head. Operculum with a long spine; barbel short. Pectoral, dorsal, anal, the longer of the ventral filaments, and the lower part of the body with brown dots. Fins without black margin. (*Kaup.*)

Montevideo.

5. Phycis mediterraneus.

Tinca marina, *Salv.* p. 232. fig. 93; *Aldrov.* iii. cap. 9. p. 192; *Jonston,* i. tit. 1. cap. 1. art. 2. tab. 1. no. 5.
Asellus callarias, *Willughby,* p. 205. pl. N. 12.
Blennius phycis, *L. Syst. Nat.* i. p. 442; *Brünn. Ichth. Mass.* p. 28; *Delaroche, Ann. Mus.* xiv. 1809, p. 280.
Phycis mediterranea, *Delaroche, Ann. Mus.* xiii. p. 332; *Risso, Eur. Mérid.* iii. p. 222; *Cuv. Règne Anim.*
—— limbatus, *Valenc. in Webb & Berth. Iles Canar. Poiss.* p. 78. pl. 14. fig. 2.

D. 9 | 62. A. 59. L. lat. 130. Vert. $\frac{19-18}{28-29}$.

The first dorsal has the rays not produced into filaments, and is scarcely higher than the second; the ventral extends to the origin of the anal. Eleven or twelve series of scales between the anterior dorsal and the lateral line. Vertical fins with a black margin and a narrow white edge; ventrals brownish, immaculate.

Mediterranean and the neighbouring parts of the Atlantic.

a. Twenty-four inches long. Madeira. Presented by J. Y. Johnson, Esq.
b. Ten inches long. Madeira. Presented by J. Y. Johnson, Esq.
c–d. Fine specimens. Madeira. Presented by the Rev. R. T. Lowe.
e–g Half-grown: skins. Mediterranean.
h. Adult: stuffed.
i, k. Adult and half-grown: skeletons. Madeira.

Description.—The height of the body is nearly equal to the length of the head, which is one-fourth of the total length (without caudal). Snout obtuse, rounded, somewhat depressed, with the upper jaw overlapping the lower, rather longer than the eye. Cleft of the mouth subhorizontal, the maxillary extending beyond the middle of the eye. Teeth villiform, forming bands in the jaws and on the vomer; there are several larger ones intermixed with the small ones on the side of the lower jaw. Barbel slender, rather longer than the eye. The width of the bony interorbital space equals the vertical diameter of the orbit; head nearly entirely covered with small scales, which advance forwards to the lips. The fins are enveloped in a rather loose scaly membrane, which leaves the outer fourth of the rays uncovered. The anterior dorsal is much higher than long, its height being two-fifths of the length of the head; it commences dorsal fin midway between the end of the snout and the root of the caudal fin. The height of the body is less than the length of the head, which is one-fifth of the total (without caudal). Snout produced, obtuse, a little longer than the postorbital portion of the head. Eye small, with free orbital rim, its length being equal to the width of the interorbital space. Length of the pectoral about one-half of the distance of its root from the ventral. Upper margin of the dorsal fin obliquely descending backwards. Back and sides irregularly mottled with dark brown; generally a blackish blotch on the lower half of the base of the caudal. Dorsal and caudal fins with brownish-black spots arranged in irregular cross bands.

Europe, with the exception of Denmark and Scandinavia.

a. Adult. Holland. From Dr. Bleeker's Collection.
b–d. Adult. Neckar. From the Stuttgart Collection.
e–h. Adult. River Blau. From the Stuttgart Collection.
i–m. Adult and half-grown. Danube.
n. Adult. Moravia (named *Cobitis variabilis*, Heckel).
o, *p–q*. Adult and half-grown.
r. Half-grown. England. Presented by T. Gray, Esq.

20. Nemachilus galilæus.

Cobitis galilæa, *Günth. Proc. Zool. Soc.* 1864, p. 493.

D. 12. A. 8. V. 7.

Scaleless. Caudal fin truncate. The origin of the dorsal fin is somewhat nearer to the end of the snout than to the root of the caudal. The height of the body is considerably less than the length of the head, which is contained five times and one-fourth in the total (without caudal). Snout of moderate length, a little shorter than the postorbital portion of the head. Eye small, with a free circular eyelid, its diameter not being quite as wide as the interorbital space. Length of the pectoral more than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin straight, oblique. Body finely mottled with brown; four brown cross bars on the back before, and four behind the dorsal fin.

Lake of Galilee.

a. Type of the species, 3 inches long. Presented by Th. W. Beddome, Esq.

21. Nemachilus panthera.

Cobitis panthera, *Heckel, in Russegger's Reisen*, i. p. 1087, taf. 12. fig. 2.
—— leopardus, *Heckel, l. c.* ii. p. 241, taf. 18. fig. 4.

D. 10. A. 7. V. 6.

Caudal fin truncate. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. The height of the body is less than the length of the head, which is two-ninths, or rather more than one-fifth, of the total (without caudal). Snout of moderate length, obtuse, somewhat shorter than the postorbital portion of the head. Eye small. Length of the pectoral fin more upper jaw overlapping the lower, rather longer than the eye. Cleft of the mouth subhorizontal, the maxillary extending nearly to the vertical from the posterior margin of the eye. Teeth cardiform, forming narrow bands in the jaws and on the vomer. Barbel small. The width of the bony interorbital space equals the vertical diameter of the orbit. Head covered with small scales, except on the lips. The operculum terminates in a stiff, longish point. Only the base of the fins is enveloped in a scaly membrane: the anterior dorsal is higher than long, its height being less than one-third of the length of the head; it commences immediately behind the vertical from the root of the pectorals. The margins of the second dorsal and of the anal are even, slightly rounded behind, the latter fin being somewhat the lower. Caudal subtruncated. Pectoral two-thirds as long as the head. The vent is situated below the seventh ray of the second dorsal.

Body brownish, tinged with yellowish; vertical fins dark-brown; vent blackish; inside of mouth white.

12. LÆMONEMA.

Phycis, sp., *Lowe.*

Body of moderate length, covered with small scales. Fins naked. A separate caudal; two dorsal fins and one anal, the anterior dorsal composed of five rays; ventrals reduced to a single long ray, bifid at its end. Bands of villiform teeth in the jaws; a small group of vomerine teeth; none on the palatine bones. Chin with a barbel. Branchiostegals seven.

Sea of Madeira.

1. Læmonema yarrellii.

Phycis yarrellii, *Lowe, Trans. Zool. Soc.* ii. p. 190, and *Fish. Madeir.* p. 43. tab. 7.

D. 5 | 60. A. 59. L. lat. ca 110.

Anterior rays of the first dorsal prolonged; ventral not extending to the vent. Eight series of scales between the anterior dorsal and the lateral line.

Madeira.

a. Seven and a half inches long. Madeira.—Type of the species.

Description.—Head rather depressed, not much higher than broad; nape slightly elevated; body much compressed; tail tapering into a narrow band. The greatest depth of the body is above the vent, where it equals the length of the head, and is a little more than one-fifth of the total length (without caudal). Snout obtuse, rounded, with the upper jaw overlapping the lower, as long as the eye, the diameter of which is thrice and two-thirds in the length of the head. Cleft of the mouth subhorizontal, the maxillary not extending to below the posterior margin of the orbit. Teeth villiform, of equal size, forming narrow bands in the jaws. The lateral parts of the head of the vomer are toothless, and there is only a very small group of three or four teeth in the middle of its anterior margin. Barbel very slender, half as long as the eye. Nostrils immediately in front of the eye. The width of the bony interorbital space is two-thirds of the vertical diameter of the eye. Operculum terminating in a small, acute, pungent spine. The head is nearly entirely covered with not very small scales, only the lips and the foremost part of the snout being naked. Fins naked, not enveloped in a loose membrane. The first dorsal commences before the root of the pectoral and is very narrow and high, the first ray being as long as the head. The second dorsal commences behind the root of the pectoral, its rays slightly increasing in length posteriorly. The vent is situated below the vertical of the sixth ray of the second dorsal, and the anal commences immediately behind it; anal lower than dorsal. Caudal very narrow, pointed, entirely free from dorsal and anal. Pectoral rather longer than ventral, its length being equal to the distance of the anterior margin of the orbit from the extremity of the operculum.

Body brown, immaculate; fins black.

2. Læmonema robustum.

D. 5 | 53. A. 47. L. lat. ca 130.

Anterior rays of the first dorsal prolonged; ventral extending to the eleventh anal ray. About thirteen series of scales between the anterior dorsal and the lateral line.

Madeira.

a. Fourteen inches long. Presented by J. Y. Johnson, Esq.

Description.—Head rather depressed, but higher than broad; nape elevated; body much compressed; tail tapering into a narrow band. The greatest depth of the body is below the origin of the second dorsal, and is a little less than the length of the head, which is contained thrice and three-fourths in the total (without caudal). Snout depressed, obtuse, rounded, with the upper jaw overlapping the lower, longer than the orbit, the diameter of which is a little more than one-fifth of the length of the head. Cleft of the mouth subhorizontal, the maxillary extending to below the posterior margin of the orbit. Teeth villiform, forming bands; the vomerine teeth form a small roundish patch in the middle of the head of the vomer. Barbel very slender, shorter than the eye. The width of the interorbital space equals the vertical diameter of the orbit. Operculum terminating in an obtuse point covered with skin; the head, with the exception of the snout, is covered with small scales. The first dorsal commences above the root of the pectoral and is narrow and high, the first ray being as long as the head without snout. The second dorsal commences behind the pectoral, its rays slightly increasing in length posteriorly. The vent is situated in the vertical from the fifth ray of the second dorsal; anal lower than dorsal, terminating at some distance before the end of the dorsal. Caudal very narrow and rather elongate. The length of the pectoral is four-fifths of that of the head; it does not extend so far backwards as the inner ventral filament. The outer filament of the ventral considerably shorter than the inner.

Body brown, immaculate; fins black.

13. HALOPORPHYRUS*.

Body elongate, covered with small scales. A separate caudal; two dorsal fins and one anal, the first dorsal with four rays; ventrals narrow, composed of six rays. Jaws with bands of villiform teeth; vomerine teeth in a small roundish patch; none on the palatine bones. Chin with a barbel. Branchiostegals seven.

Mediterranean; Madeira.

1. Haloporphyrus lepidion.

Gadus lepidion, *Risso, Ichth. Nice*, p. 118. pl. 11. fig. 40 (bad).
Lota lepidion, *Risso, Eur. Mérid.* iii. p. 218.

D. 4 | 54. A. 49. V. 6. L. lat. 210.

The upper jaw is longer than the lower; the first dorsal ray and the ventral fins prolonged into very long filaments. Brown.

Mediterranean; Madeira.

a. Very fine specimen, two feet long. Madeira. Presented by J. Y. Johnson, Esq.

Description.—Head higher than broad, with the nape elevated and with the snout depressed; body compressed; tail tapering into a narrow band. The greatest depth of the body is below the origin of the second dorsal, and a little less than the length of the head, which is one-fourth of the total (without caudal). Snout subconical, obtusely rounded, with the upper jaw overlapping the lower, much longer than the orbit, the diameter of which is one-sixth of the length of the head. Cleft of the mouth subhorizontal, the maxillary not extending to the vertical from the hind margin of the eye. Teeth villiform, forming bands; the band of the upper jaw not covered by the lips; a small rounded patch of villiform teeth in the middle of the head of the vomer. Barbel very slender, longer than the orbit. The width of the interorbital space equals the horizontal diameter of the orbit. Operculum terminating in an obtuse point covered with skin; the head, with the exception of the lips, is entirely covered with small scales. There are about fifteen longitudinal series of scales between the anterior dorsal and the lateral line. The first dorsal is very narrow, situated above the root of the pectoral; its first ray is produced into a filament, which is much longer than the head. The second dorsal and the anal are enveloped in a loose scaly membrane: the former is of moderate height, has the margin even, and terminates at some distance from the caudal. The vent is situated in the vertical from the twelfth ray of the second dorsal: the anal commences immediately behind it; there is a slight depression in the middle of its length, the middle rays being shorter than the anterior and posterior; it terminates a little before the dorsal. Caudal truncated. The length of the pectoral is rather more than one-half of that of the head. The outer ventral ray is prolonged into two filaments, the inner of which is the longest, as long as the head and extending to the vent.

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* The generic name of *Lepidion* is preoccupied.

Blackish-brown, immaculate; fins black.

Membranes of the œsophagus and stomach extremely thick, the latter with a short cæcal sac; pylorus surrounded by fifteen slender appendages; the intestines make only one complete circumvolution. Liver very voluminous, with a long thick lobe on each side, extending downwards to the end of the abdominal cavity. Air-bladder with a very thick outer case, divided into two portions, an upper terminating in a conical prominence, and a lower of oblong-ovate form. Testicles elongate, kidney-shaped.

14. LOTA.

Gadus, sp., *Artedi.*
Lota, sp., *Cuv. Règne Anim.*
Lota, *Nilss. Skand. Faun.* iv. p. 579.

Body elongate, covered with very small scales. A separate caudal; two dorsal fins and one anal; ventrals narrow, composed of six rays. Villiform teeth of equal size in the jaws and on the vomer; none on the palatines. The first dorsal with ten to thirteen well-developed rays. Chin with a barbel. Branchiostegals seven or eight.

Freshwater fishes of the temperate regions of the northern hemisphere.

1. Lota vulgaris.

Burbot, Eel-pout. Die Quappe, Aalraupe, Treische. Lake (Sweden). La Lotte.

a. Synonymy of the European specimens.

Mustela, *Plin. Hist. Nat.* ix. c. 16.
Lota, *Rondel.* ii. p. 164; *Aldrov.* v. cap. 46. p. 648; *Gesner,* p. 599; *Jonston,* iii. tit. 3. cap. 11. p. 168. tab. 29. fig. 10; *Willughby,* p. 125. tab. H. 3. fig. 4; *Ray,* p. 68.
Bottatriæ, Triseus. *Salv.* p. 213.
Strinsias s. Botarissas, *Bellon. De Aquat.* p. 302.
Clarias fluviatilis, *Bellon. De Aquat.* p. 304.
Gadus, sp., *Artedi, Syn.* p. 38. no. 13, and *Genera,* p. 22. no. 10; *Gronov. Zoophyl.* no. 313. p. 97, and *Mus.* i. p. 21.
Silurus, sp., *Artedi, Spec.* p. 107.
Rutten, *Marsigl. Danub.* iv. p. 71. tab. 24.
Gadus lota, *L. Syst. Nat.* i. p. 440; *Bl. Fische Deutschl.* ii. p. 177. taf. 70; *Lacép.* ii. p. 435; *Pall. Zoogr.* iii. p. 201; *Turt. Brit. Faun.* p. 91; *Donov.* iv. pl. 92; *Hartm. Helvet. Ichthyol.* p. 50; *Ekstr. Fische Mörkö,* p. 235, or *Vet. Akad. Handl.* 1831, p. 43; *Brandt & Ratzeb.* i. p. 52. tab. 7. fig. 2; *Cuv. Règne Anim. Ill. Poiss.* pl. 106. fig. 3.
Ascan. Ic. taf. 28.
Enchelyopus, sp., *Klein, Pisc. Miss.* iv. p. 57. no. 13. tab. 15. fig. 2.
Burbot, *Penn. Brit. Zool.* iii. p. 175, and edit. 1812, iii. p. 265.
Enchelyopus lota, *Bl. Schn.* p. 52; *Gronov. Syst. ed. Gray,* p. 101.
Lota vulgaris, *Cuv. Règne Anim.*; *Jurine, Poiss. Lac Leman,* pl. 2; *Jenyns, Man.* p. 448; *Yarr. Brit. Fish.* 2nd edit. ii. p. 267, and 3rd edit. i. p. 572; *Fries och Ekstr. Skand. Fisk.* p. 170. tab. 41; *Günth.*

Fische Neckar, p. 124; *Nilss. Skand. Faun.* iv. p. 580; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 530.
Molva lota, *Flem. Brit. An.* p. 192.
Lota communis, *Rapp, Fische Bodensee's*, p. 36.
Anatomy: *Brandt & Ratzeb.* i. tab. 8. fig. 3; *Rapp, l. c.*; *Delaroche, Ann. Mus.* xiv. 1809, p. 279.
Skeleton: *Agass. Poiss. Foss.* v. pl. H (Lota fluviatilis); *Günth. l. c.*

β. Synonymy of the American specimens.

Gadus lota, *Penn. Arct. Zool. Introd.* p. cxci; *Schoepf, Schrift. Gesellsch. Naturf. Freund. Berl.* viii. p. 141.
—— lacustris, *Mitch. Am. Month. Magaz.* ii. p. 244.
Lota maculosa, *Lesueur, Journ. Acad. Nat. Sc.* i. p. 83; *Richards. Faun. Bor.-Amer. Fish.* p. 248; *Kirtland, Bost. Journ. Nat. Hist.* 1842, iv. p. 24. pl. 3. fig. 1; *Dekay, New York Fauna, Fish.* p. 284. pl. 52. fig. 168; *Agass. Lake Super.* p. 325.
Molva maculosa, *Lesueur, Mém. Mus.* v. 1819, p. 159. pl. 16 (too slender).
—— huntia, *Lesueur, l. c.* p. 161.
Lota compressa, *Lesueur, Journ. Acad. Nat. Sc.* i. p. 84; *Storer, Fish. Massach.* p. 134; ? *Dekay, l. c.* p. 285. pl. 78. figs. 244, 245.
—— inornata, *Dekay, l. c.* p. 283. pl. 45. fig. 145.
—— brosmiana, *Storer, Bost. Journ.* iv. pl. 5. fig. 1.

B. 8. D. (10–12) 13 | 67–75. A. 66–71. Vert. 21/38. Cæc. pyl. 30.

Barbel rather longer than the eye; a short barbel on each side at the nostrils. Yellowish or brownish, more or less marbled with black.

Fresh waters of central and northern Europe, of Canada, and of the adjoining parts of the United States.

a. European specimens.

a–g. Adult: skins. Frith of Forth. From Dr. Parnell's Collection.
h. Half-grown: skin. River Wiske, Yorkshire.
i–k. Half-grown. London market. Presented by Mr. E. Gerrard.
l–m. Adult and young: skins. England. From Mr. Yarrell's Collection.
n. Adult: stuffed. England. Presented by Dr. J. E. Gray.
o. Adult. England. Presented by Dr. J. E. Gray.
p. Adult. Gotha River (Sweden).
q. Half-grown. River Elbe. Presented by Dr. E. Rüppell.
r–s. Half-grown. Lake of Constance. From the Stuttgart Museum.
t, u. Adult. Danube.
v. Young. Switzerland. Presented by Prof. L. Agassiz.
w. Half-grown. South Europe. Presented by Dr. E. Rüppell.
x–y. Adult: stuffed.
z. Half-grown: skin. From Gronow's Collection.
α–β. Adult: skulls. Lake of Constance. From Dr. A. Günther's Collection.

β. American specimens.

a. Thirty-five inches long: stuffed. Pine Island Lake. Presented by Sir J. Richardson.
b, c, d. Adult: stuffed. Pine Island Lake. Presented by Sir J. Richardson.
e. Adult: stuffed. Lake Madawaska (Canada).

15. MOLVA.

Lota, sp., *Cuv. Règne Anim.*
Molva, *Nilss. Skand. Faun.* iv. p. 573.

Body elongate, covered with very small scales. A separate caudal; two dorsal fins and one anal; ventrals narrow, composed of six rays. Teeth in the jaws and on the vomer in a band; mandible and vomer with several large teeth; none on the palatines. The first dorsal with ten to sixteen well-developed rays. Chin with a barbel.

Marine fishes of the temperate regions of the northern hemisphere.

1. Molva vulgaris.

The Ling.
Clarias marina, *Bellon. De Aquat.* p. 131.
Asellus longus, *Schonev.* p. 18; *Willughby*, p. 175. tab. L. 2. no. 2; *Ray*, p. 56.
Gadus, sp., *Artedi, Synon.* p. 36. no. 9; *Genera*, p. 22. no. 9.
Lange, *Ström, Söndm.* i. p. 292.
Gadus molva, *L. Syst. Nat.* i. p. 439; *Fabr. Faun. Grœnl.* p. 148; *Bl. Fische Deutschl.* ii. p. 174. taf. 69; *Lacép.* ii. p. 432; *Turt. Brit. Faun.* p. 91; *Donov.* pl. 102.
Ling, *Penn. Brit. Zool.* iii. p. 173, and ed. 1812, iii. p. 262.
Lingue, *Duham. Pêches*, ii. sect. 1. cap. 8. p. 145. pl. 25. fig. 1.
Enchelyopus molva, *Bl. Schn.* p. 51.
? Gadus molva, *Faber, Fische Isl.* p. 86.
Gadus molva et raptor, *Nilss. Prodr.* pp. 45, 46.
Lota molva, *Jen. Man.* p. 448; *Yarr. Brit. Fish.* 2nd edit. ii. p. 264, and 3rd edit. i. p. 569; *Parn. Wern. Mem.* vii. p. 352, or *Fish. Frith of Forth*, p. 192; *Thomps. Nat. Hist. Irel.* iv. p. 185.
Molva vulgaris, *Flem. Brit. An.* p. 192; *Nilss. Skand. Faun.* iv. p. 573.

D. 13–16 | 64–70. A. 58–66. V. 6. Vert. 27/37.

The upper jaw is the longest. Strong teeth in the mandible and on the vomer. Barbel longer than the eye; a short barbel on each side at the nostril. The diameter of the eye equals the width of the interorbital space.

From the northern coasts of Europe to Greenland and Iceland.

a. Fine specimen. North coast of Norway. Purchased of Mr. Brandt.
b–c. Adult and half-grown: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
d–e. Adult and half-grown: skins. From Mr. Yarrell's Collection.
f. Half-grown: mounted.
g. Skeleton, 51 inches long. British.
h. Half-grown: skeleton.

Parnell and Nilsson have fully described this species.

This species has a greater number of *vertebræ* than any of the preceding; the abdominal cavity terminates below the twenty-seventh vertebra, and the caudal portion of the vertebral column is as long as, or a little shorter than, the abdominal. The neural spines of the anterior and middle abdominal vertebræ are depressed, and like their transverse processes rather short. The bones of the skull are more solid than in the true *Gadus*.

2. Molva abyssorum.

Byrkelange, *Ström, Trondhj. Handl.* iii. p. 446. tab. 8, and *Beskriv.* ii. p. 275.
Gadus, no. 346, *Müll. Prodr. Zool. Dan.* p. 42.
—— abyssorum, *Nilss. Prodr.* p. 46.
Molva abyssorum, *Nilss. Skand. Faun.* iv. p. 577.

D. 14 | 76–78. A. 74–75. V. 6.

The lower jaw is the longest. Strong teeth in the mandible and on the vomer. The ventral does not extend further backwards than the pectoral; the anal and dorsal terminate in the same vertical.

Coasts of Scandinavia.

3. Molva elongata.

Gadus elongatus, *Otto, Conspect.*
Lotta elongata, *Risso, Eur. Mérid.* iii. p. 217. fig. 47; *Costa, Faun. Napol.* pl. 38.
Molva elongata, *Nilss. Skand. Faun.* iv. p. 579.

D. 10 | 78. A. 73. V. 6.

The lower jaw is the longest. Strong teeth in the mandible and on the vomer. The ventral fin extends further backwards than the pectoral, the anal further than the dorsal.

Mediterranean.

16. HYPSIPTERA.

Hypsiptera, *Günth. Fish.* ii. p. 386.

Body compressed, moderately elongate, covered with minute scales, and with a silvery pigment all over the lateral and inferior parts. Head compressed, with the upper jaw longest. A separate caudal; two dorsal fins, the anterior of which is composed of six distinct rays connected by a membrane. One anal fin. Ventrals composed of three or four rays. Minute teeth in the jaws and on the vomer. A barbel at the chin.

Atlantic (open sea).

After having first placed this genus in the family *Scombridæ*, I was induced, by its resemblance to *Couchia*, to examine the symphysis of the lower jaw, where I found a small barbel concealed between the mandibles. This, in connexion with the jugular fins, leaves no doubt as to the true position of this genus, although its malacopterygian character cannot be ascertained from the rays of the first dorsal, their upper portions being broken off. The genus differs from *Couchia* in the structure of the anterior dorsal fin, thereby approaching *Lota*, &c.

1. Hypsiptera argentea.

Günth. l. c.

B. 7. D. 6 | 50. A. 55. V. 3–4.

Silvery, the uppermost portion of the back greyish-green; fins transparent.

Atlantic.

a. Two inches long. Open sea. Presented by J. B. Godfrey, Esq.

A detailed description has been given in the volume quoted; and it need only be remarked, that the small specimens there mentioned, with "the spines in greater number, short, and filament-like," do not belong to this genus, but probably to *Couchia argentata*.

Lota argentea, figured by Bonaparte in the 'Fauna Italica,' ought perhaps to be referred to this genus, as the fin appears to be formed of true rays connected by a membrane, and as the body is evidently compressed. There is, however, no barbel at the chin, and a small one at each nostril. No description has been given of this fish.

17. COUCHIA.

Ciliata, *Couch in Loud. Mag. Nat. Hist.* v. p. 15.
Motella, sp., *Nilss., Reinh. et al. auct.*
Couchia, *Thomps. Nat. Hist. Irel.* p. 190.

Body compressed, moderately elongate, covered with minute scales, and with a silvery pigment inferiorly. Head compressed, with the upper jaw longest. A separate caudal; two dorsal fins, the anterior of which is composed of a band of numerous short fringes, concealed in a longitudinal groove, the first fringe prolonged. One anal fin. Ventrals composed of about four rays. Minute teeth in the jaws and on the vomer. Snout with barbels. Air-bladder none. Pyloric appendages in small number.

Very small fishes inhabiting the open sea in the North Atlantic, only occasionally visiting the coasts.

1. **Couchia glauca.**

The Mackerel Midge.
Ciliata glauca, *Couch in Loud. Mag. Nat. Hist.* v. p. 15. fig. 2, & p. 741, and in *Zool. Journ.* i. p. 132.
Motella glauca, *Jen. Man.* p. 451; *Yarr. Brit. Fish.* 2nd edit. ii. p. 281, and 3rd edit. i. p. 586.
—— argenteola, *Düben, Vet. Akad. Handl.* 1844, pp. 92, 97; *Nilss. Skand. Faun. Fisk.* p. 590.
Couchia minor, *Thomps. Nat. Hist. Irel.* iv. p. 188.

D. 44. A. 38. V. 3.

Barbels five, four on the upper and one on the lower jaw. The length of the head is more than the depth of the body, and two-ninths of the total length (without caudal). The length of the ventral is two-thirds of that of the head. The width of the interorbital space equals the diameter of the eye. Sides and belly silvery.

British and Scandinavian Seas.

a–c. From 1 to 1½ inch long. Polperro. Presented by J. Couch, Esq.
d, e–l. Same size. Falmouth. Purchased.

2. **Couchia argentata.**

? Gadus argenteolus, *Mont. Wern. Mem.* ii. p. 449; *Flem. Brit. Anim.* p. 193; *Jen. Man.* p. 451
? Motella argenteola, *Yarr. Brit. Fish.* ed. 2. ii. p. 281, and ed. 3. i. p. 589.

Motella argentata, *Reinh. Dansk. Vidensk. Selsk. Afhandl.* vii. 1838, p. 128.

D. 58 (ca). A. 44 (ca). V. 3. Cæc. pyl. 8.

Barbels three, two on the upper and one on the lower jaw. The length of the head is rather more than the depth of the body, and two-ninths of the total length (without caudal). The length of the ventral is two-thirds of that of the head. The width of the interorbital space equals the diameter of the eye. Sides and belly silvery.

Atlantic to the coasts of Greenland.

a. Three inches long (vertical fins dried). Greenland.
b–e. Half-grown and young. Atlantic. Presented by J. B. Godfrey, Esq.

18. MOTELLA.

Gadus, sp., *Artedi.*
Motella, *Cuv. Règne Anim.*
Onos, *Risso, Eur. Mérid.* iii. p. 214.
Motella et Molvella, *Kaup, Wiegm. Arch.* 1858, p. 90.

Body elongate, covered with minute scales. Head not compressed. A separate caudal. Two dorsal fins, the anterior of which is composed of small fringes, more or less concealed in a longitudinal groove; the first fringe prolonged. One anal fin. Ventrals composed of five to seven rays. Teeth in the jaws and on the vomer in a band.

Coasts of Europe, Iceland, and Greenland.

The *skull* of *Motella* does not differ essentially in its structure from that of the true *Gadi*, the single bones being rather more solid. The abdominal portion of the vertebral column is much shorter than the caudal,—

M. mustela having 15 abdominal and 32 caudal vertebræ,
M. tricirrata having 16 abdominal and 33 caudal vertebræ,
M. maculata having 15 abdominal and 33 caudal vertebræ.

The neural spines of the anterior vertebræ are strong and much depressed; the interneurals of the first dorsal fin rudimentary and extremely numerous. The parapophyses commence to become prominent and dilated from the sixth vertebra; those of the posterior abdominal vertebræ are of moderate width and length, bearing feeble ribs. The anterior vertebræ have rather short, straight, styliform ribs, each with an epipleural attached to it. The bones belonging to the anal fin do not extend forwards beyond the extent of the caudal portion.

1. Motella mustela.

Five-bearded Rockling.
Mustela vulgaris, *Willughby*, p. 121 (descr. part.); *Ray*, p. 67.
Gadus, sp., *Artedi, Synon.* p. 37. no. 11; *Genera*, p. 22. no. 2; *Gronov. Zoophyl.* no. 314.
Gadus mustela, *L. Syst. Nat.* i. p. 440; *Donov. Brit. Fishes*, i. pl. 14; *Turt. Brit. Faun.* p. 92; *Flem. Brit. An.* p. 193; *Holb. Bohusl. Fisk.* ii. p. 52. c. fig.; *Faber, Fische Isl.* p. 81.

Five-bearded Cod, *Penn. Brit. Zool.* iii. p. 177. pl. 33, and edit. 1812, iii. p. 268. pl. 36.
Enchelyopus mustela, *Bl. Schn.* p. 52.
Motella quinque-cirrata, *Cuv. Règne Anim.*; *Yarr. Brit. Fishes,* 2nd edit. ii. p. 278, and 3rd edit. i. p. 583; *Parn. Wern. Mem.* vii. p. 355, or *Fish. Frith of Forth,* p. 195; *Thomps. Nat. Hist. Irel.* iv. p. 186.
—— mustela, *Nilss. Prodr.* p. 49, and *Skand. Faun.* iv. p. 589; *Jen. Man.* p. 450.
Enchelyopus mustela, *Gronov. Syst. ed. Gray,* p. 101.
Molvella borealis, *Kaup, Wiegm. Arch.* 1858, p. 90.

D. 49–51. A. 41. V. 7. Pylor. app. 8. Vert. 15/32.

Snout obtuse, broad, rather depressed, with five barbels: two at the nostrils, two at the upper lip and one at the lower. All the teeth villiform, of equal size.

Coasts of Europe and Iceland.

a–b. Ten inches long: skins. Frith of Forth. From Dr. Parnell's Collection.
c. Adult: stuffed. Frith of Forth.
d, e, f, g, h–i. Adult and young. Brighton.
k. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
l, m–n. Adult. South Wales.
o. Young. Polperro. Presented by J. Couch, Esq.
p–r. Half-grown. South Devonshire. Mus. Leach.
s. Adult: stuffed. English coast.
t. Fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
u, v, w, x. Adult and half-grown.
y. Adult: skin. From Gronow's Collection.
z. Adult: skeleton.

2. **Motella tricirrata.**

Three-bearded Rockling.
Mustela vulgaris, *Rondel.* ix. c. 15. p. 281; *Gesner,* p. 89; *Aldrov.* iii. c. 8. p. 290; *Jonston,* i. tit. 1. cap. 1. art. 2. tab. 1. fig. 4; *Willughby,* p. 121. tab. H. 4. fig. 4.
Galea venetorum, *Bellon. De Aquat.* p. 130; *Gesner,* p. 90.
Mustela marina, *Ray, Syn.* p. 164. fig. 9.
Sorghe, *Willughby,* tab. H. 2. fig. 1.
Three-bearded Cod, *Penn. Brit. Zool.* iii. p. 176. pl. 33, and edit. 1812, iii. p. 267. pl. 36.
Gadus tricirratus, *Bl.* taf. 165; *Donov. Brit. Fishes,* i. pl. 2; *Turt. Brit. Faun.* p. 92; *Flem. Brit. An.* p. 193.
Enchelyopus mediterraneus, *Bl. Schn.* p. 52.
Gadus jubatus, *Pall. Zoogr.* iii. p. 202; *Rathke, Faun. d. Krym,* p. 333.
Motella vulgaris, *Cuv. Règne Anim.*; *Yarr. Brit. Zool.* 2nd edit. ii. p. 270, and 3rd edit. i. p. 575; *Thomps. Nat. Hist. Irel.* iv. p. 186.
Gadus mustella et G. fuscus, *Risso, Ichth. Nice,* pp. 120, 121.
Onos mustella et O. fusca, *Risso, Eur. Mérid.* iii. pp. 215, 216.
Motella tricirrata, *Nilss. Prodr.* p. 48, and *Skand. Faun.* iv. p. 586; *Jen. Man.* p. 449; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 531, *Poiss.* pl. 26. fig. 1.

D. 54–60. A. 50. V. 5. Vert. 16/33.

Snout obtuse, broad, rather depressed, with three barbels: one at each of the anterior nostrils, the third at the chin. Teeth villiform and of equal size in the upper jaw. Generally a series of white dots along the lateral line.

Coasts of Europe.

a. Half-grown: skin. Great Britain. From Mr. Yarrell's Collection.
b. Half-grown. Great Britain. From the Haslar Collection.
c–d. Young. South Devonshire. Mus. Leach.
e–f. Young. Falmouth. Purchased.
g. Thirteen inches long. Falmouth. Purchased.
h–i. Young. Polperro. Presented by J. Couch, Esq.
k. Adult: stuffed. Polperro.
l. Young. Mediterranean. Presented by Dr. E. Rüppell.
m. Adult. Bay of Naples. Presented by S. P. Pratt, Esq.
n. Adult. Trebizond. From the Collection of the Zoological Society.
o, p. Adult and half-grown.
q. Sixteen inches long: stuffed.
r. Adult: skeleton. British.

Reinhardt distinguishes another species from this, *M. ensis* (Dansk. Vidensk. Selsk. Afhandl. vii. 1838, p. 128), with the first dorsal ray as long as the head.—Greenland.

3. **Motella maculata.**

Onos maculata, *Risso, Eur. Mérid.* iii. p. 216.
Motella vulgaris, *Parn. Wern. Mem.* vii. p. 354, or *Fishes Frith of Forth*, p. 194.
? Motella capensis, *Kaup in Wiegm. Arch.* 1858, p. 90.

D. 56–62. A. 50. V. 5. Vert. 15/33.

Very similar to *M. tricirrata*. Snout obtuse, broad, rather depressed, with three barbels: one at each of the anterior nostrils, the third at the chin. Teeth of the upper jaw in a band; stronger teeth in the outer series. Brown: sometimes head, body, and dorsal fin with numerous roundish, small, whitish spots. Large individuals generally with a row of brown spots along the base of the dorsal fin.

Coasts of Europe.

a–b. Eighteen inches long: skins. Plymouth. From Mr. Yarrell's Collection.
c–d. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
e. Adult: skin. Great Britain. From Mr. Yarrell's Collection.
f. Adult: stuffed. English coast.
g. Adult: stuffed. Devonshire. Presented by W. Cocks, Esq.
h–i. Half-grown. Cannes. Presented by Th. Günther, M.D.
k, l. Half-grown. Lisbon. Presented by G. Hough, Esq.
m, n–o, p–q. Fine adult, half-grown, and young specimens. Madeira.
r. Half-grown. Sicily. Presented by W. Swainson, Esq.
s, t. Half-grown. Dalmatia.
u. Adult: skeleton. From the Haslar Collection.

4. Motella cimbria.

Four-bearded Rockling.
Gadus cimbrius, *L. Syst. Nat.* i. p. 440; *Lacép.* ii. p. 442; *Straussenfelt, Vet. Akad. Handl.* 1773, p. 22. tab. 2.
Enchelyopus cimbricus, *Bl. Schn.* p. 50. tab. 9.
Motella cimbrica, *Nilss. Prodr.* p. 48, and *Skand. Faun.* iv. p. 587; *Yarr. Brit. Fishes,* 2nd edit. ii. p. 274, and 3rd edit. i. p. 579; *Parn. Wern. Mem.* vii. p. 449. pl. 44.

D. 50. A. 43–45. V. 5.

Snout obtuse, much longer than the eye, scarcely depressed, with the upper jaw prominent, and with four barbels: one at each of the anterior nostrils (which are the longest), a third in the middle of the snout, and a fourth at the chin. All the teeth villiform, of equal size. The first ray of the anterior dorsal prolonged, filiform. Dorsal and anal with a black blotch posteriorly.

Coasts of northern Europe.

a. Fine specimen. England. Presented by Dr. Melville.
b–c. Twelve inches long: skins. Frith of Forth.
d. Fourteen inches long: skin. From Mr. Yarrell's Collection.
e. Adult. Båhuslän. Presented by Hr. A. W. Malm.

5. Motella pacifica.

Schleg. Faun. Japon. Poiss. p. 249.

D. 45. A. 38. V. 5.

Snout obtuse, subconical, longer than the eye, with three barbels: one on each side at the nostrils and one at the chin. Teeth in a band, with an outer series of stronger ones. Dorsal and anal black posteriorly.

Japan.

19. RANICEPS.

Raniceps, *Cuv. Règne Anim.*

Head large, broad and depressed; body of moderate length, covered with minute scales. A separate caudal. Two dorsal fins, the anterior of which is very short, rudimentary. One anal fin. Ventrals composed of six rays. Card-like teeth in the jaws and on the vomer, intermixed with stronger ones in the former. Branchiostegals seven; pyloric appendages none.

Coasts of northern Europe.

1. Raniceps trifurcus.

Barbus minor, *Ray, Syn.* p. 164. fig. 8; *Couch, Linn. Trans.* xiv. p. 75.
Blennius raninus, *L. Syst. Nat.* 10th edit. p. 258.
Trifurcated Hake, *Penn. Brit. Zool.* iii. p. 172. pl. 32.
Trifurcated Tadpole-fish, *Penn. Brit. Zool.* edit. 1812, iii. p. 272. pl. 38.
Least Hake, *Penn. Brit. Zool.* iii. p. 171, and edit. 1812, iii. p. 261.
Blennius raninus et fuscus, *Müll. Prodr.* p. 43.
Gadus raninus, *Müll. Zool. Dan.* tab. 45; *Brünn. Dansk. Vid. Selsk. Skr.* xii. p. 291.

Gadus fuliginosus, *Walb. in Schrift. Gesellsch. Naturf. Freund. Berl.* v. 1784, p. 107.
—— trifurcus, *Walb. Art.* iii. p. 139.
—— minimus, *Walb. Art.* iii. p. 143.
Phycis fusca, *Bl. Schn.* p. 57.
Blennius raii, *Bl. Schn.* p. 171.
Batrachoides blennioides, *Lacép.* ii. pp. 451, 456.
Blennius tridactylus, *Lacép.* ii. p. 484.
Raniceps trifurcatus, *Flem. Brit. An.* p. 194; *Jen. Man.* p. 453; *Yarr. Brit. Fishes*, 2nd edit. ii. p. 292, and 3rd edit. i. p. 598; *Parn. Wern. Mem.* vii. p. 359. tab. 36, or *Fishes Frith of Forth*, p. 199. pl. 36; *Thomps. Nat. Hist. Irel.* iv. p. 188.
—— jago, *Flem. Brit. An.* p. 194.
—— niger, *Nilss. Prodr.* p. 50, and *Skand. Faun. Fisk.* p. 594; *Fries & Ekstr. Skand. Fisk.* p. 92. pl. 21.
Batrachocephalus blennioides, *Holb. Göth. Vet. Sællsk. n. Handl.* iii. p. 39. c. fig.
Raniceps fuscus, *White, Catal. Brit. Fishes*, p. 96.

D. 3 | 66. A. 60. V. 6.

Lower jaw shortest, with a short barbel. Dark-brown.

Coasts of northern Europe.

a. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
b. Adult. Berwick. Presented by Dr. G. Johnston.
c. Adult. Polperro. Presented by J. Couch, Esq.
d. Adult: stuffed. Polperro. Presented by J. Couch, Esq.
e. Half-grown. Frith of Forth. From the Collection of the Zoological Society.
f. Young: skin. Frith of Forth.
g. Half-grown: stuffed: bad state.
h, *i*. Fine specimens. Båhuslän. Presented by Hr. A. W. Malm.

20. BREGMACEROS.

Bregmaceros, *Thomps. in Charlesw. Mag. Nat. Hist.* 1840, iv. p. 184.
Calloptilum, *Richards. Voy. Sulph. Fish.* p. 94.

Body fusiform, compressed posteriorly, covered with cycloid scales of moderate size. Two dorsal fins: the anterior reduced to a single long ray on the occiput; the second and the anal much depressed in the middle, nearly divided into two: ventrals very long, composed of five rays, the outer of which are very elongate. Minute moveable teeth round the margin of the mouth and on the vomer, none on the palatines. No air-bladder; no pyloric appendages. Gill-openings very wide, the gill-membranes being united below the throat, not attached to the isthmus. Pseudobranchiæ none; seven branchiostegals.

China Seas and Philippines.

1. Bregmaceros macclellandii.

Bregmaceros McClellandii, *Thomps. l. c.* (fig. bad).
Calloptilum mirum, *Richards. l. c.* p. 95. pl. 46. figs. 4–7.

B. 7. D. 1 | 16+X+15. A. 22+X+20. V. 5–6. L. lat. 64. L. transv. 14.

The occipital dorsal ray is very slender, longer than the head; the dorsal and anal fins can be laid backwards in a groove, formed by the scales along the base of those fins. The anterior portion of the second dorsal and of the anal are elevated, and connected with the posterior lower portion by a series of very short and extremely feeble rays. The vent is situated at the end of the anterior third of the total length. The three outer ventral fins are dilated, compressed, simple and much elongate, extending to, or nearly to, the middle of the anal fin; the second and third are sometimes united at the base. Silvery, minutely dotted with brown.

Coasts of China. Philippine Islands. Mouth of the Ganges.

a. China Sea. Presented by Vice-Admiral Sir E. Belcher, C.B.

b, *c*, *d*. From the Haslar Collection.

21. BROSMIUS.

Brosmius, *Cuv. Règne Anim.*

Body moderately elongate, covered with very small scales. A separate caudal, one dorsal and one anal; ventrals narrow, composed of five rays. Teeth in the upper jaw in a narrow band; vomerine and palatine teeth. Branchiostegals seven. A barbel.

Polar regions; extending to the northern coasts of Europe and of the United States.

1. Brosmius brosme.

Brosme, *Ström, Söndm.* i. p. 272; *Pontopp. Norg. Nat. Hist.* ii. p. 207.
Torsk, *Penn. Brit. Zool.* iii. p. 178. tab. 34, and edit. 1812, iii. p. 269. tab. 37; *Low, Faun. Orc.* p. 200.
Ascan. ii. p. 7. tab. 17.
Gadus brosme, *Müll. Prodr. Zool. Dan.* p. 41; *Fabr. Faun. Grœnl.* p. 149; *L. Gm.* i. p. 1175; *Bl. Schn.* p. 9; *Lacép.* ii. p. 450; *Donov. Brit. Fish.* iii. pl. 70; *Turton, Brit. Faun.* p. 92; *Faber, Fische Isl.* p. 84.
—— lubb, *Euphras. Vet. Akad. Handl.* 1794, p. 223. tab. 8.
Enchelyopus lub et E. brosme, *Bl. Schn.* p. 51.
Blennius torsk, *Lacép.* ii. p. 508.
Brosmius vulgaris, *Flem. Brit. An.* p. 194; *Jen. Man.* p. 452; *Yarr. Brit. Fish.* ed. 2. ii. p. 285, and ed. 3. i. p. 591; *Parn. Wern. Mem.* vii. p. 357, or *Fish. Frith of Forth*, p. 197; *Nilss. Skand. Faun.* iv. p. 597.
? Brosmius vulgaris, *Storer, Fish. Massach.* p. 136 *; *Dekay, New York Faun. Fish.* p. 289. pl. 44. fig. 143.

D. 90. A. 75. V. 5.

Barbel nearly as long as the eye. The dorsal fin commences above the root of the pectoral. Vomerine and palatine teeth intermixed with larger ones. The upper jaw is the longest.

Coasts of the north of Europe and America, extending into the polar regions.

a. Fine specimen. North coast of Norway. Purchased of Mr. Brandt.

2. Brosmius flavescens.

Lesueur, Mém. Mus. v. 1819, p. 158.

A pair of barbels at the chin. The lower jaw is the longest.

Banks of Newfoundland.

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* "The dorsal fin commences at a distance back of the pectorals, equal to about half the length of the head."

Fam. 4. OPHIDIIDÆ.

Gadoidei, pt., et Malacopterygii apodes, pt., *Cuvier.*
Ophidini et Ammodytidæ, *Müller, Owen.*

Body more or less elongate, naked or scaly. Vertical fins generally united into one; no separate anterior dorsal or anal; dorsal occupying the greater portion of the back. Ventral fins rudimentary (reduced to a filament) or absent, jugular (except in *Brotulophis*). Gill-openings wide, the gill-membranes not attached to the isthmus. Pyloric appendages none, or in small number.

Inhabitants of the seas of nearly all regions.

Synopsis of the Groups and Genera.

First Group: **Brotulina.**

Ventral fins present, attached to the humeral arch.

Snout with barbels; eye of moderate size......	1. Brotula, p. 371.
Eye none, or quite rudimentary..................	2. Lucifuga, p. 372.
Barbel none; lateral line continuous, simple; canine teeth none..............	3. Sirembo, p. 373.
Body naked; a pair of canine teeth superiorly and inferiorly	4. Xiphogadus, p. 374.
Caudal free	5. Dinematichthys, p. 374.
Barbel none; lateral line interrupted	6. Bythites, p. 375.
Barbel none; lateral line double along a portion of the tail	7. Pteridium, p. 375.
(*Appendix.*)—Ventrals opposite the pectoral; vomerine teeth none	8. Brotulophis, p. 376.

Second Group: **Ophidiina.**

Ventral fins replaced by a pair of bifid filaments (barbels) inserted below the glossohyal.

Palatine teeth small................................	9. Ophidium, p. 376.
An outer series of strong teeth in the jaws and on the palatine bones	10. Genypterus, p. 379.

Third Group: **Fierasferina.**

No ventral fins whatever; vent at the throat.

Pectoral fins present	11. Fierasfer, p. 381.
Pectoral fins none	12. Encheliophis, p. 384.

Fourth Group: **Ammodytina.**

No ventral fins whatever; vent remote from the head; gill-openings very wide, the gill-membranes not being united.

Skin with longitudinal folds	13. Ammodytes, p. 384.
Scales of moderate size	14. Bleekeria, p. 387.

Fifth Group: Congrogadina.

No ventral fins whatever; vent remote from the head; gill-openings of moderate width, the gill-membranes being united below the throat, not attached to the isthmus.

Vertical fins united	15. CONGROGADUS, p. 388.
Caudal free	16. HALIOPHIS, p. 389.

First Group. BROTULINA.

Ventral fins present, attached to the humeral arch.

1. BROTULA.

Brotula, *Cuv. Règne Anim.*

Body elongate, covered with minute scales. Eye of moderate size. Vertical fins united; each ventral reduced to a single filament, sometimes bifid at its extremity. Bands of villiform teeth in the jaws, on the vomer and the palatine bones. Snout with barbels. Eight branchiostegals; air-bladder large, with two horns posteriorly. One pyloric appendage.

Caribbean Sea. Indian Ocean.

1. Brotula barbata.

Parra, p. 70. lam. 31. fig. 2 (Brotula).
Gadus, sp., *Herrm. Comment. Tabul. Affin.* p. 337.
Enchelyopus barbatus, *Bl. Schn.* p. 52.
Brotula barbata, *Cuv. Règne Anim.*; *Poey, Mem. Cub.* ii. p. 102. lam. 9. fig. 2.

B. 8. D. 123. A. 93. V. 1. Cæc. pylor. 1. Vert. 16/39.

The height of the body is less than the length of the head, which is two-ninths of the total (without caudal). Upper jaw longest, the upper and the lower with three barbels on each side. Ventral half as long as the head; the dorsal commences behind the vertical from the root of the pectoral. Fins enveloped in thick skin.

Caribbean Sea.

2. Brotula multibarbata.

Schleg. Faun. Japon. Poiss. p. 251. pl. 111. fig. 2.

B. 8. D., C. & A. 186. Cæc. pylor. 2.

The height of the body is contained four times or four times and a half, the length of the head five times in the total length. The width of the interorbital space is three-quarters of the diameter of the eye, which equals the length of the snout. Upper jaw the longer; the maxillary extends to below the posterior margin of the eye; both jaws with three barbels on each side. Opercle terminating in a spine. The length of the ventral is two-thirds of that of the head; each ventral filament composed of two rays, enveloped in one common membrane. The dorsal commences above the axil of the pectoral. Brownish.

Japan, Celebes, Amboyna, Booroo.

? *a*. Young. East Indian Archipelago. From Dr. Bleeker's Collection.

3. Brotula ensiformis.

B. 8. D. 127. A. 103.

The height of the body is one-sixth or one-seventh of the total length, the length of the head one-sixth or somewhat more than one-sixth. The width of the interorbital space is less than the horizontal diameter of the orbit. Snout longer than the eye, with twelve barbels. The lower jaw is received within the upper, the maxillary extending to below the posterior margin of the orbit. Teeth villiform, of equal size: in a broad band anteriorly in the upper jaw and on the palatine bones, in a narrow band on the side of the upper jaw, in the lower, and on the vomer; the vomerine band is bent at an acute angle. Operculum terminating in a small spine. The dorsal fin commences above the middle of the pectoral, and the distance of the vent from the head is more than the length of the latter. Pectoral rounded, one-half of the length of the head. Ventral filaments inserted at the humeral symphysis, not bifid at the extremity, two-thirds of the length of the head. Scales small, but very distinct; lateral line inconspicuous. Brown; vertical fins with darker margins.

Aneiteum.

a–b. Fifteen inches long: stuffed. From Mr. Macgillivray's Collection.

4. Brotula burbonensis.

Kaup in Wiegm. Arch. 1858, p. 92.

Upper jaw with six barbels, the lower with four. The dorsal fin commences behind the end of the pectoral. Head compressed, with narrow forehead, and with the eye situated high up the sides. The length of the head is contained five times and a half in the total (without head and caudal). (*Kaup.*)

Bourbon.

From a skin in the Paris Museum.

2. LUCIFUGA.

Lucifuga, *Poey, Mem. Cub.* ii. p. 95.

Body moderately elongate, covered with minute scales. Eye absent, or quite rudimentary and covered by skin. Vertical fins united; ventral reduced to a simple short and thin filament. Teeth in the jaws and on the vomer, sometimes on the palatines. Head without barbels, but with numerous minute cilia or tubercles. Two nostrils on each side. Eight or seven branchiostegals; the gill-opening extends forwards nearly to the symphysis of the lower jaw; gills four, pseudobranchiæ none; air-bladder rounded posteriorly, fixed to the base of the skull. Pyloric appendages none. Male with an anal papilla.

Inhabitants of subterranean fresh waters in Cuba.

1. Lucifuga subterraneus.

Poey, l. c. p. 96. lam. 11. fig. 1 (head), lam. 10. figs. 1–4 & 6–8, and lam. 11. figs. 2–5 & 18 (anatomy).

B. 7–8. D. 70. A. 70. Vert. 11/36.

Nape of the neck scarcely elevated, and generally scaly; cleft of the mouth wide. Teeth in the jaws villiform; none on the palatine bones.

Cuba.

2. Lucifuga dentatus.

Poey, l. c. p. 102. lam. 9. fig. 1; lam. 10. figs. 5, 6 & 9; lam. 11. figs. 6–8, 15 & 17 (anatomy).

B. 7. D. 90. A. 70. Vert. 11/37.

Nape of the neck elevated and naked; the length of the head is two-sevenths of the total; cleft of the mouth wide. A series of strong teeth on the palatines and along the edge of the mandible.

Cuba.

3. SIREMBO.

Sirembo, *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Japan*, iv. p. 22.
Brotella, *Kaup in Wiegm. Arch.* 1858, p. 92.

Body elongate, covered with very small scales; lateral line simple, more or less indistinct. Eye of moderate size. Vertical fins united; each ventral reduced to a single filament, both close together, but each with a distinct base, inserted at the foremost part of the humeral symphysis. Bands of villiform teeth in the jaws, on the vomer and the palatines. Upper jaw overlapping the lower. Snout without barbels. Eight branchiostegals; pseudobranchiæ and air-bladder present. Pyloric appendages in moderate number.

Japanese Seas.

1. Sirembo imberbis.

Brotula imberbis, *Schleg. Faun. Japon. Poiss.* p. 253. pl. 111. fig. 3.
Sirembo imberbis, *Bleek. l. c.* p. 24.
Brotella imberbis, *Kaup, l. c.*

D. 95. A. 75. Cæc. pylor. 12.

Operculum with a strong spine posteriorly. Ventral inserted in the vertical from the extremity of the maxillary, or a little in advance of the posterior margin of the orbit. The dorsal commences behind the root of the pectoral. The distance of the vent from the head is a little more than the length of the latter. Vertical fins edged with blackish.

Japan.

a. Japan.

2. Sirembo armatus.

Brotula armata, *Schleg. Faun. Japon. Poiss.* p. 255.
Brotella armata, *Kaup, l. c.*

D., A. & C. 175.

Operculum with one, præoperculum with three spines. The dorsal fin commences above the posterior third of the pectoral.

Japan.

From a dried specimen 2 feet long.

4. XIPHOGADUS.

Body very long, low and compressed, naked. Eye of moderate size. Vertical fins continuous, the dorsal commencing above the eye; each ventral reduced to a filament, inserted at the humeral arch. Barbels none. Each jaw with a single series of teeth, and with a pair of strong canine teeth.

East Indies.

1. Xiphogadus setifer.

Russell, i. pl. 39.
Xiphasia (!) setifer, *Swainson.*

B. 5. D. 223. A. 112. C. 10.

The length of the head is one-thirteenth of the total length, and equals its distance from the vent. Two of the caudal rays terminate in short filaments.

Length of the single specimen observed 14 inches.

Vizagapatam.

5. DINEMATICHTHYS.

Dinematichthys, *Bleeker, Batoe,* p. 318.
Halias, *Ayres, Proc. Calif. Acad.* ii. p. 52.
Brosmophycis, *Gill, Proc. Acad. Nat. Sc. Philad.* 1861, p. 168.

Body elongate, covered with very small scales. Eye small. One dorsal and anal, not continuous with the caudal; each ventral reduced to a single filament, both close together, and inserted at the throat, but behind the isthmus. Bands of teeth in the jaws, on the vomer and on the palatine bones. Upper jaw scarcely longer than the lower; barbels none. Six branchiostegals; gill-opening very wide; pseudobranchiæ none. A prominent anal papilla with a pair of horny claspers (in *D. iluocœteoïdes*).

East Indian Archipelago. Coasts of California.

1. Dinematichthys iluocœteoïdes.

Bleeker, *l. c.* p. 318.

D. 83. A. 69. C. 14.

The height of the body equals the length of the head and of the ventrals, and is two-ninths of the total; snout obtuse, longer than the eye; nostrils close to the eye. Palatine teeth in a long stripe.

Operculum with a spine posteriorly. Cheeks scaly. The dorsal commences above the middle of the pectoral. Yellowish-green; a violet cross-band behind the eyes.

Batoe, Nias, Goram.

a. Young. From Dr. P. v. Bleeker's Collection.

2. **Dinematichthys marginatus.**

Brosmius marginatus, *Ayres, l. c.* i. p. 13.
Halias marginatus, *Ayres, l. c.* ii. p. 52.

The height of the body is equal to the length of the head, and two-ninths of the total. Upper jaw overlapping the lower; palatine bones with teeth anteriorly only. Operculum terminating in a short, sharp spine. Head naked; snout longer than the eye, its length being nearly equal to the width of the interorbital space. Fins enveloped in a thick membrane; the dorsal arises over about the middle of the pectorals. Brown.

San Francisco.

6. BYTHITES.

Bythites, *Reinh. in Dansk. Vidensk. Selsk. Afhandl.* vii. 1838, p. 178.

Body elongate, covered with minute scales; lateral line interrupted. Eye of moderate size. Vertical fins united; ventral reduced to a single simple filament*, inserted at the humeral symphysis. Bands of teeth in the jaws, on the vomer and the palatine bones. Jaws of equal length. Barbel none. Eight branchiostegals; gill-membranes united, not attached to the isthmus; air-bladder large, rounded posteriorly. Two pyloric appendages. A thick, conical, horizontal papilla behind the vent (in the male).

Greenland.

1. **Bythites fuscus.**

Reinhardt, l. c. p. 179. tab. 7 & 8.

The height of the body is less than the length of the head, which is nearly one-fourth of the total; head large, thick, with the snout obtuse; cleft of the mouth wide, the maxillary extending behind the eye. Head with minute cirri. Vertical fins enveloped in thick skin; ventrals two-thirds as long as the head. Uniform dark-brown.

Known from a single specimen more than 3 inches long, and fully described by Prof. Reinhardt.

7. PTERIDIUM.

Oligopus, *Risso, Ichth. Nice,* p. 141 (not *Lacép.*).
Pteridium, *Scopoli.*

Body elongate, covered with rather small scales; lateral line double along a portion of the tail. Eye of moderate size. Vertical fins united; each ventral reduced to a single short filament, composed of two rays, and inserted in front of the pectoral. Jaws with a band of minute, and with an outer series of strong pointed teeth; a small patch of teeth on the vomer. Jaws equal anteriorly? Barbel none. Eight branchiostegals. Gill-apparatus? An air-bladder. Pyloric appendages two.

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* It is formed by two rays, which are united by a common membrane.

Mediterranean.

1. Pteridium atrum.

Oligopus ater, *Risso, l. c.* p. 142. pl. 11. fig. 41.
—— niger, *Risso, Eur. Mérid.* iii. p. 338.
Gadopsis ater, *Filippi in Sieb. & Kölliker, Zeitschr. Wiss. Zool.* 1855, p. 170 (air-bladder).
Pteridium atrum, *Filippi & Verany, Sopra alcuni Pesci nota, in Mem. Accad. Sc. Torin.* 2 ser. xviii. sep. cop. p. 11. fig. 6 (air-bladder).

D. 64. C. 14. A. 44. (*Risso.*)

Dark brown.

Mediterranean.

Appendix.

8. BROTULOPHIS.

Brotulophis, *Kaup in Wiegm. Arch.* 1858, p. 93.

Tail tapering. Vertical fins united; ventral fins reduced to single filaments, *opposite the pectoral.* Teeth small, pointed, of unequal size; none on the vomer.

Island of Soolo.

1. Brotulophis argentistriatus.

Kaup, l. c.

The length of the head is one-sixth of the total, and rather more than twice the length of the pectoral. The distance of the vent from the mandible is twice the length of the head. Black, with a silvery band from the eye to the end of the tail. Lower parts silvery; axil of the pectoral black.

The typical specimen is 108^{mm} long.

Second Group. OPHIDIINA.

Ventral fins replaced by a pair of bifid filaments (barbels) inserted below the glossohyal.

9. OPHIDIUM [*].

Ophidium, pt., *Artedi, Gen.* p. 19.
Ophidium, *Cuv. Règne Anim.*

Body elongate, compressed, covered with very small scales. Eye of moderate size. Dorsal, caudal, and anal fins continuous, low; ventral fins replaced by a pair of bifid filaments (barbels), inserted below the glossohyal. Teeth in the jaws, forming bands, generally small; those on the vomer and the palatine bones small. Lower jaw received within the upper. Vent situated at some distance behind the pectoral. Seven branchiostegals; gill-openings very wide; gills four, a slit behind the fourth; pseudobranchiæ and air-bladder present. No pyloric appendages.

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[*] 1. Ophidium taylori, *Girard in U. S. Pacif. R. R. Exped. Fishes,* p. 138.—Monterey, California.
2. —— josephi, *Girard in Proc. Acad. Nat. Sc. Philad.* 1858, p. 170.—St. Joseph's Island, Texas.
3. —— graëllsi, *Poey, Mem. Cub.* ii. 1861, p. 425.—Cuba.

Mediterranean. Atlantic.

1. **Ophidium barbatum.**

Ophidium, *Plin.* iii. cap. 9 & 11; *Rondel.* xiv. c. 2. p. 397; *Gesner*, pp. 91, 104; *Aldrov.* iii. c. 26. p. 353.

Grillus, *Bellon. De Aquat.* pp. 132, 133; *Gesner*, p. 92.

Ophidion, no. 1, *Artedi, Syn.* p. 42.

Ophidium barbatum, pt., *L. Syst. Nat.* i. p. 431; *Brouss. Phil. Trans.* 1781, p. 436. tab. 23; *Brünn. Ichth. Mass.* p. 15; *Bl.* taf. 159. fig. 1; *Bl. Schn.* p. 484; *Lacép.* ii. p. 279; *Delaroche, Ann. Mus.* xiv. p. 275; *Turton, Brit. Faun.* p. 88; *Cuv. Règne Anim.*; *Risso, Ichth. Nice*, p. 96, and *Eur. Mérid.* iii. p. 211; *Jen. Man.* p. 481; *Yarr. Brit. Fish.* 2nd edit. ii. p. 415, and 3rd edit. i. p. 76.

Enchelyopus, no. 4, *Klein, Pisc. Miss.* iv. p. 52.

Ophidium barbatum, *Müll. Abhandl. Berl. Acad.* 1843, p. 150. taf. 4. fig. 1 (air-bladder).

D. ca 140. A. ca 120.

The outer pair of the barbels is considerably longer than the inner, and shorter than the head. The depth of the head is contained once and two-thirds in its length. The lower branch of the outer branchial arch with five or six gill-rakers, nearly half as long as the diameter of the eye. The end of the ethmoid is curved, hook-like. Head entirely naked. Vertical fins edged with black.

There are two small bones joined to the first vertebra, directed downwards; they are connected by a thin transverse filament with a large crescentic bone, fitting into the anterior end of the air-bladder, and situated between a pair of thick processes of the fourth vertebra. Muscles attached to the anterior bones and to the crescentic bone draw them forwards. (*Müll.*)

Mediterranean.

2. **Ophidium broussonetii.**

Ophidium barbatum, pt., *Brouss. Phil. Trans.* 1781, p. 436.

—— broussonetii, *Müll. Abhandl. Berl. Acad.* 1843, p. 150. taf. 4. fig. 3 (air-bladder).

D. ca 140. A. ca. 120.

Very similar to *O. barbatum*, but with only four gill-rakers on the lower branch of the outer branchial arch, and with a different structure of the air-bladder. No hook-like prominence at the ethmoid.

Air-bladder ovate, without a contracted part. There is no separate bone fitting into the anterior portion of the air-bladder. The muscles are fixed to the air-bladder itself. Processes of the first and fourth vertebræ small, not swollen.

Mediterranean.

a. Adult. Padstow, Cornwall. Museum Leach.

3. **Ophidium rochii.**

Ophidion, *Willughby*, p. 113.
Ophidium barbatum, pt., *Delaroche, Ann. Mus.* xiv. p. 275.
Ophidium barbatum, *Rathke in Müll. Arch.* 1838, p. 423.
—— rochii, *Müll. Abhandl. Berl. Acad.* 1843, p. 150. taf. 4. fig. 2 (air-bladder).

D. ca 140. A. ca 120.

Very similar to *O. broussonetii*, but with a different structure of the air-bladder.

Processes of the first and fourth vertebræ very thin; the single bone at the anterior extremity of the air-bladder is cuneiform. Air-bladder contracted anteriorly and posteriorly, and with a round foramen behind, closed by thin mucous membrane only. (*Müll.*)

Mediterranean.

Whether *Ophidium barbatum*, Mitch. Lit. & Phil. Trans. New York, i. p. 362. pl. 1. fig. 2, or *Ophidium marginatum*, Dekay, New York Faun. Fish. p. 315. pl. 52. fig. 169, is a species different from the European we cannot say, the single specimen in the British Museum not having either intestines or gills. Externally it is nearly identical with *O. barbatum*.

a. Adult: bad state. New York.

4. **Ophidium vasalli.**

Risso, Ichth. Nice, p. 97. pl. 5. fig. 12, and *Eur. Mérid.* iii. p. 212; *Cuv. Règne Anim.*; *Müll. Abhandl. Berl. Acad.* 1843, p. 152. taf. 4. fig. 5 (air-bladder); *Costa, Faun. Napol.* pl. 20.

D. ca 130. A. ca 110.

The four barbels are nearly equal in length, as long as the head, and extending to the base of the pectoral. The depth of the head is contained once and two-thirds in its length. Teeth villiform. The lower branch of the outer branchial arch with four gill-rakers, the longest of which is longer than one-half of the diameter of the eye. Ethmoid without prominent spine. Operculum covered with rudimentary scales. Vertical fins without black edge.

Air-bladder globular, with a round foramen posteriorly; no single bone in front of its anterior extremity.

Mediterranean.

a, b, c. Adult.

5. **Ophidium brasiliense.**

Valenciennes, in Kaup, Apod. Fish. p. 154.

Barbels short, not reaching to the chest; no spine on the snout. Teeth rather stout. The dorsal fin only is edged with black. (*Kaup.*)

Brazils.

6. Ophidium brevibarbe.

Cuv. Règne Anim.; *Cuv. Règne Anim. Ill. Poiss.* p. 326; *Müll. Abhandl. Berl. Acad.* 1843, p. 153. pl. 4. fig. 4 (air-bladder); *Kaup, Catal. Apod. Fish.* p. 154. pl. 16. fig. 1 (head).

A short decurved spine on the point of the snout. Teeth strong; occiput and gill-cover scaly. Vertical fins edged with black. (*Kaup.*)

Air-bladder oblong-ovate, without contracted portion and without posterior foramen; no single anterior bone, replaced by a cartilage. (*Müll.*)

Brazils.

10. GENYPTERUS.

Xiphiurus *, *Smith, Ill. Zool. South Africa.*
Genypterus, *Philippi in Wiegm. Arch.* 1857, p. 268.
Hoplophycis, *Kaup in Wiegm. Arch.* 1858, p. 93.

Body elongate, compressed, covered with minute scales. Eye of moderate size. Vertical fins continuous; ventral fins replaced by a pair of bifid filaments (barbels) inserted below the glossohyal. Teeth in the jaws, on the vomer and the palatine bones: the outer series in the jaws and the single series of the palatines contain strong teeth. Lower jaw received within the upper. Vent situated at some distance behind the pectoral. Seven or eight branchiostegals; gill-openings wide; gills four, a slit behind the fourth; pseudobranchiæ and air-bladder present. Pyloric appendages in small number (six).

Coasts of South Africa. Temperate parts of the South Pacific.

1. Genypterus capensis.

Koning van Klipvischen (Cape).
Ophidium blacodes, pt., *Forst. Descr. Anim.* p. 115 (*Bl. Schn.* p. 485).
Xiphiurus capensis, *Smith, Ill. Zool. S. Afr. Pisc.* c. tab.
Hoplophycis lalandii, *Kaup in Wiegm. Arch.* 1858, p. 93.

B. 7–8. D. 156. A. 117.

Barbels shorter than the head, bifid at their extremities. The maxillary extends beyond the eye. Vent situated in, or before, the middle of the length of the fish. Operculum terminating in a horizontal spine.

Cape of Good Hope.

a–b. Thirty-nine inches long: stuffed. Cape. Presented by Sir A. Smith.—Types of the species.

c–d. Half-grown and young: stuffed. Cape. Presented by Sir A. Smith.

2. Genypterus blacodes.

Ophidium blacodes, pt. (from New Zealand, and not from the Cape), *Forst. Descr. Anim. ed. Licht.* p. 115; *Bl. Schn.* p. 484.
—— blacodes, *Müll. Abhandl. Berl. Acad.* 1843, p. 153.

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* Preoccupied.

Ophidium blancodes, *Tschudi, Faun. Per. Ichth.* p. 29.
—— maculatum, *Tschudi, l. c.* tab. 5 (barbels omitted.)

Barbels much shorter than the head, split close from the base, the outer filament much longer than the inner. Reddish-olive, marbled with darker; vertical fins with dark-brown margins.

New Zealand. Coasts of Chile and Peru.

a. Sixty-two lines long. Valparaiso. From Mr. Bridges' Collection.

The following description is taken from the single specimen in the British Museum, which is evidently very young:—

The head is twice as long as high, its length being contained four times and two-thirds in the total; it is compressed, and the width of the interorbital space is less than that of the orbit. Snout obtusely conical, a little longer than the diameter of the eye, which is contained five times and a half in the length of the head. The cleft of the mouth is slightly oblique, with the upper jaw overlapping the lower, and with the maxillary extending to below the posterior margin of the orbit. Each jaw is armed with an outer series of strong teeth, within which there is another series of much smaller ones; vomerine teeth in a narrow band, smaller than those of the palatines, which form a single series. The longer portion of the barbel is about half as long as the head. The operculum terminates in a cutaneous flap, enveloping a very small spine.

The height of the body is three-fifths of the length of the head, which is one-half of the distance of the vent from the extremity of the snout. Tail compressed, tapering. The dorsal fin commences above the middle of the pectoral, and is composed of very numerous closely-set rays like the anal. The pectoral is rounded, inserted in the lower half of the depth of the body; it is not quite half as long as the head.

Scales minute; the lateral line is scarcely visible, and disappears entirely in the middle of the body.

Reddish-olive, marbled with darker; head and trunk minutely dotted with brown; vertical fins edged with brown.

3. Genypterus chilensis.

Congrio.
Conger chilensis, *Guich. in Gay, Hist. Chil. Zool.* ii. p. 339.
Genypterus nigricans, *Philippi, l. c.* p. 269.

Barbels split close from the base. Black: sides and anal fins with white spots.

Coasts of Chili.

Adopting the opinion of Philippi, I formerly arranged this fish among the Blennoids (vol. ii. p. 294); but since I have discovered its *generic* identity with *Ophidium blacodes*, Forst., it is necessary to remove it from that family. It is even possible that it is specifically identical with the fish figured by Tschudi as *Ophidium maculatum*.

Third Group. FIERASFERINA.

No ventral fins whatever; vent at the throat.

11. FIERASFER*.

Fierasfer, *Cuv. Règne Anim.*
Echiodon, *Thomps. Proc. Zool. Soc.* 1837, p. 55.
Diaphasia, *Lowe, Proc. Zool. Soc.* 1843, p. 92.
Oxybeles, *Richards. Voy. Ereb. & Terr. Fish.* p. 74.

Body produced into a very long and tapering tail, naked. Eye of moderate size. Vertical fins continuous, very low; no ventrals, no barbels. Cardiform teeth in the jaws, on the vomer and the palatine bones, sometimes with the addition of canines; the teeth on the vomer form an oblong patch, and are generally stouter than the others. Lower jaw received within the upper. Vent situated at the throat. Seven branchiostegals; gill-openings wide, the gill-membranes united below, and not attached to the isthmus; gills four, a slit behind the fourth; pseudobranchiæ none; air-bladder present. No pyloric appendages.

Temperate seas of Europe. East Indian Archipelago. Coasts of Australia and New Zealand.

1. Fierasfer acus.

Fierasfer.
Gymnotus acus, *Brünn. Ichth. Mass.* p. 13; *L. Gm.* i. p. 1140; *Bl. Schn.* p. 522.
Notopterus fontanesii, *Risso, Ichth. Nice*, p. 82. pl. 4. fig. 11.
Fierasfer imberbis, *Cuv. Règne Anim.*, and *Mém. Mus.* i. p. 320; *Müll. Abhandl. Berl. Acad.* 1843, p. 153. taf. 4. fig. 6 (air-bladder).
Ophidium fierasfer, *Risso, Eur. Mérid.* iii. p. 212.
Fierasfer fontanesii, *Costa, Faun. Nap.* tab. 20 bis.
—— acus, *Kaup, Apod. Fish.* p. 157.

The length of the head is one-eighth of the total length. The greatest width of the head is rather less than one-third of its length. Gill-openings rather wide, the united gill-membranes leaving the greater portion of the isthmus uncovered. Teeth cardiform; only a few on the side of the lower jaw and on the middle of the vomer are a little larger than the rest. Dorsal fin low, but very distinct. Head and body with brownish dots, which are sometimes arranged in cross series.

Mediterranean and the neighbouring parts of the Atlantic.

a. Adult. South Europe. Presented by R. B. Webb, Esq.
b. Half-grown.

2. Fierasfer affinis.

Similar to *F. acus*, but with a different dentition.

The length of the head is one-eighth of the total; its greatest width is rather less than one-third of its length. Gill-openings rather wide, the united gill-membranes leaving the greater portion of the isthmus uncovered. Teeth cardiform: a pair in front of the upper jaw, a series on the side of the lower, and several others on the vomer larger than the rest. Dorsal fin low, but very distinct. The length of the pectoral nearly one-half of that of the head.

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* 1. Fierasfer boraborensis, *Kaup, Apod. Fish.* p. 160.—Borabora.

Hab. —— ?

a. Eight inches long. Old Collection.

3. Fierasfer homei.

Oxybeles homei, *Richards. Voy. Ereb. & Terr. Fishes*, p. 74. pl. 44. figs. 7–18.

—— brandesii, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Chiroc. &c.* p. 24, and *Natuurk. Tydschr. Nederl. Ind.* i. p. 276. figs. 1–3; vii. pp. 162, 495.

Fierasfer homei, *Kaup, Apod. Fish.* p. 158.

The length of the head is contained seven times and a half or eight times in the total length; its width is one-half of its length. Gill-openings of moderate width, the united gill-membranes leaving one-half of the isthmus uncovered. Vent a little in advance of the vertical from the root of the pectoral. Teeth small, cardiform: two larger ones anteriorly in the upper jaw and on the vomer; an outer series of stronger teeth along the side of the lower jaw. Dorsal fin very low, but distinct. Yellowish, with some scattered darker dots on the back.

Vertebræ 99.

Seas of Australia. East Indian Archipelago. Feejee Islands. (Martinique?) Entering the respiratory cavities of Star-fishes and Holothuriæ.

a. Adult. Tasmania. Presented by Sir J. Richardson.—Type of the species.

b–c. Fine specimens. Amboyna. Purchased of Mr. Frank.

d. Half-grown. Feejee Islands. Voyage of the 'Herald.'

4. Fierasfer neglectus.

Peters in Wiegm. Arch. 1855, p. 260.

The length of the head is one-tenth of the total, or two-fifths of the distance of the snout from the origin of the dorsal fin. Teeth in the jaws and on the palatines in a narrow band, those of the outer series being stronger and curved; vomer with three very long, compressed, curved teeth. (*Pet.*)

Island of Ibo (Mozambique).

5. Fierasfer gracilis.

Oxybeles gracilis, *Bleek. Banda*, v. p. 105.

The height of the body is one-half of the length of the head, which is one-eleventh of the total; the width of the head is one-third of its length. Gill-openings of moderate width, the united gill-membranes leaving one-half of the isthmus uncovered. Vent a little in advance of the vertical from the root of the pectoral. Teeth small, of equal size, in a single series in the upper jaw, rather larger in the lower, without canines. The vomerine teeth are the strongest. Dorsal fin very low, but distinct. Yellowish; blackish posteriorly.

Banda, Amboyna.

a. Adult. From Dr. P. v. Bleeker's Collection.

This species may prove to be identical with the preceding, of which we have not seen an example.

6. Fierasfer parvipinnis.

Kaup, Apod. Fish. p. 160. pl. 16. fig. 2.

Head blunt, flat above and swollen on the cheeks, its length being one-ninth of the total. Dorsal fin very low, and scarcely perceptible; the length of the pectoral is one-fourth of that of the head. Teeth subequal in length; those on the vomer largest, conical. Yellowish, with dark dots. (*Kaup.*)

New Ireland*.

7. Fierasfer caninus.

The length of the head is one-seventh of the total; its width is not quite one-third of its length. Gill-openings wide, the united gill-membranes leaving the greater portion of the isthmus uncovered. Vent below the root of the pectoral. The upper jaw with a pair of canine teeth anteriorly; the lower and the vomer with a series of strong curved teeth. Dorsal fin very distinct; the length of the pectoral is rather less than one-half of that of the head.

Hab. —— ?

a. Four and a half inches long: not good state.

8. Fierasfer dentatus.

Fierasfer dentatus, *Cuv. Règne Anim.*; *Kaup, Apod. Fish.* p. 158.
Echiodon drummondii, *Thomps. Proc. Zool. Soc.* 1837, p. 55, and *Trans. Zool. Soc.* ii. p. 207. pl. 38; *Yarr. Brit. Fish.* 2nd edit. ii. p. 417, and 3rd edit. i. p. 82.

D. 180. C. 12. A. 180. Vert. 98.

The length of the head is contained nine times and a half in the total; its width is two-sevenths of its length. Gill-openings wide, the united gill-membranes leaving the greater portion of the isthmus uncovered. Vent below the middle of the pectoral. Upper jaw with two pairs of canine teeth anteriorly, the lower with one pair; the other teeth cardiform, nearly uniform in size. Dorsal fin well developed. Head and body spotted with brown.

Coast of Ireland.

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* See *Wiegm. Arch.* 1856, p. 100.

9. **Fierasfer lumbricoides.**

Oxybeles lumbricoides, *Bleek. Natuurk. Tydschr. Nederl. Ind.* vii. 1854, p. 163.

The height of the body is one-half of the length of the head, which is contained twenty-one times in the total (without a portion of the tail, which has been lost in the single specimen known). (*Bleek.*)

Ceram.

12. ENCHELIOPHIS.

Encheliophis, *Müll. Abhandl. Berl. Acad.* 1843, p. 153.

Body compressed; tail tapering to a long band. Vertical fins united, low; no pectorals, no ventrals. Gill-membranes united below the throat, not attached to the isthmus. Vent situated immediately behind the gill-opening. Branchiostegals six; air-bladder with a muscular apparatus for dilatation of its anterior part.

Philippines.

1. **Encheliophis vermicularis.**

Müll. l. c. p. 154. taf. 5. figs. 4 & 5.

Uniform blackish-brown.—Length 4 inches.

Philippines.

Fourth Group. AMMODYTINA.

No ventral fins whatever; vent remote from the head; gill-openings very wide, the gill-membranes not being united.

13. AMMODYTES *.

Ammodytes, *Artedi, Genera*, p. 16.

Body elongate, low, subcylindrical, covered with very small scales. Skin with longitudinal folds extending along the whole length of the belly. One long dorsal and anal, composed of feeble short rays which can be received in a groove. Jaws without teeth; the lower prominent. Gill-opening very wide, the gill-membranes not united; branchiostegals seven or eight; gills four, a cleft behind the fourth; pseudobranchiæ composed of lamellæ; air-bladder none. Pyloric appendage one.

Mediterranean. Temperate parts of the North Atlantic. Coast of California.

A. Vomer anteriorly with a tooth-like bicuspid prominence: *Hyperoplus*, m.

1. **Ammodytes lanceolatus.**

The Greater Sand-Eel or Launce. Der Sand-aal. Hvit-Tobis (Sweden).
Ammodytes, *Jago in Ray, Syn. Pisc.* p. 165. tab. 2. fig. 12.

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* 1. Ammodytes vittatus, *Dekay, New York Fauna, Fishes*, p. 318. pl. 60. fig. 197.—Coasts of New York.

Enchelyopus, *Klein, Pisc. Miss.* iv. p. 56. no. 7. tab. 12. fig. 10.
Ammodytes tobianus, pt., *Bl.* taf. 75. fig. 2 (?); *Turt. Brit. Faun.* p. 87.
? Ammodytes hexapterus, *Pall. Zooqr. Ross.-As.* iii. p. 226.
Ammodytes lanceolatus, *Lesauvage, Bull. Sc. Nat.* 1825, iv. p. 262 (according to *Cuvier*).
—— tobianus, (not *L.*) *Cuv. Règne Anim.*; *Jen. Man.* p. 482; *Yarr. Brit. Fish.* 2nd edit. ii. p. 424, or 3rd edit. i. p. 89; *Parn. Wern. Mem.* vii. p. 390, or *Fish. Frith of Forth,* p. 230.
? Ammodytes tobianus, *Nilss. Skand. Faun. Fisk.* p. 653 (D. 52–53).

B. 7–8. D. 58–61. A. 30–33. Cæc. pyl. 1.

Skin with about 170 oblique, very distinct transverse folds. The height of the body is less than the length of the mandibula, which is contained twice and a fourth in the length of the head. Head one-fifth of the total length. The dorsal fin commences above, or somewhat behind, the extremity of the pectoral, and its upper margin is even. Intermaxillary not protractile; vomer with a bicuspid tooth-like prominence.

British coasts. German Ocean.

a–b. Sixteen inches long.
c. Adult: skin. From Mr. Yarrell's Collection.
d. Half-grown. Polperro. Presented by J. Couch, Esq.
e–g. Young. Wales. Presented by Dr. J. E. Gray.

B. Vomer not armed: *Ammodytes.*

2. Ammodytes tobianus.

The Lesser Sand-Eel or Launce. Der Sand-aal. Blå-Tobis or Sand-ål (Sweden).
Sandilz, *Salv.* fol. 70; *Aldrov.* ii. c. 49. pp. 252, 254; *Jonston,* i. tit. 3. cap. 3. art. 1. tab. 21. fig. 1.
Tobianus, *Schonev.* p. 76.
Ammocœtus s. Ammodytes, *Gesner,* p. 39; *Willughby,* p. 113; *Ray,* p. 38.
Ammodytes, *Artedi, Synon.* p. 29; *Gen.* p. 16; *Spec.* p. 55 (very good description); *Gronov. Zoophyl.* no. 404.
Ammodytes tobianus, *L. Syst.* i. p. 430; *Bl.* taf. 75. fig. 2 (?); *Bl. Schn.* p. 493; *Donov. Brit. Fish.* ii. pl. 33; *Lesauvage, Bull. Sc. Nat.* 1825, iv. p. 262; *Swains. Zool. Ill.* 2nd ser. i. pl. 63; *Flem. Brit. An.* p. 201; *Gronov. ed. Gray,* p. 159.
Enchelyopus, *Klein, Pisc. Miss.* iv. p. 55. no. 6. tab. 12. figs. 8, 9.
Sand-Launce, *Penn. Brit. Zool.* iii. pl. 25 (not p. 137, and edit. 1812, iii. p. 206. pl. 28).
Ammodytes alliciens, *Lacép.* ii. p. 274.
—— lancea, *Cuv. Règne Anim.*; *Jen. Man.* p. 483; *Yarr. Brit. Fish.* 2nd edit. ii. p. 429, and 3rd edit. i. p. 94 (fig. incorrect).
? Ammodytes lancea, *Parn. Wern. Mem.* vii. p. 391, or *Fish. Frith of Forth,* p. 94; *Nilss. Skand. Faun. Fisk.* p. 656 *.

B. 7. D. 54–59. A. 27–30. Vert. 63. Cæc. pyl. 1.

Skin with 120–130 oblique, very distinct transverse folds. The height of the body is more than the length of the mandibula, which is two-fifths of that of the head. The length of the head is contained five times and three-fourths in the total. The dorsal fin commences above the middle of the posterior third of the pectoral, and its upper margin is even. Intermaxillary protractile; vomer without any armature.

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* Parnell and Nilsson mention a bifurcated prominence on the vomer, whilst none of the English specimens show a trace of such an armature. There is, perhaps, a fourth European species.

British coasts. German Ocean.

a. Adult. Brighton. Presented by J. G. Children, Esq.
b. Adult. South Devon. Museum Leach.
c. Many young and half-grown specimens. Wales. Presented by Dr. J. E. Gray.
d, *e*. Fine specimens. Isle of Arran. Museum Leach.
f. Adult. England. Presented by Mr. Moore.
g, *h*, *i–k*. Adult.
l. Adult: skin. From Gronow's Collection.

3. Ammodytes siculus.

Swainson, Zool. Illustr. 2nd ser. i. pl. 63. fig. 1.

D. 57–59. A. 29.

Skin without oblique folds; body naked anteriorly, with rudimentary scales posteriorly on the tail. The height of the body equals the length of the mandibula, which is two-fifths of that of the head. The head is contained five times and one-third in the total length. The dorsal fin commences above, or somewhat behind, the extremity of the pectoral. The margins of the dorsal and anal are undulated. Intermaxillary protractile; vomer not armed.

Mediterranean.

a. Adult: bad state. Sicily. Presented by W. Swainson, Esq.—Type of the species.
b. Half-grown. From the Collection of the Zoological Society.
c. Six and a half inches long.

4. Ammodytes americanus.

Ammodytes tobianus, *Mitch. Lit. & Phil. Trans. New York,* i. p. 363; *Storer, Fish. Massach.* p. 159.
—— americanus, *Dekay, New York Fauna, Fishes,* p. 317. pl. 52. fig. 167.

D. 54–60. A. 28–31.

Skin with 130 oblique, very distinct transverse folds. The height of the body equals the length of the mandibula, which is contained twice and a third in the length of the head; the latter is one-fifth of the total. The dorsal fin commences above the extremity of the pectoral, and has the upper margin even. Intermaxillary protractile; vomer not armed.

Atlantic coasts of the United States.

a. Five inches long. Presented by the Smithsonian Institution.

5. Ammodytes personatus.

Girard in U. S. Pacif. R. R. Exped. Fish. p. 139.

B. 7. D. 55. A. 25.

The length of the head is one-fifth of the total, the diameter of the eye one-fifth of the length of the head. Margin of the dorsal even. Vomer not armed. (*Gir.*)

Cape Flattery, W. T.

6. Ammodytes dubius.

Ammodytes tobianus, *Fabr. Faun. Grœnl.* p. 140 (not *L.*).
? Ammodytes tobianus, *Faber, Fische Isl.* p. 63.
Ammodytes dubius, *Reinh. Dansk. Vidensk. Selsk. Afhandl.* vii. 1838, p. 132.

D. 64–67. A. 33–36.

Skin with about 150 oblique, very distinct transverse folds. The height of the body equals the length of the mandibula, which is contained twice and a third in the length of the head; the latter is six times and a half in the total length. The dorsal fin commences above the middle of the posterior third of the pectoral, and its upper margin is even. Intermaxillary protractile; vomer not armed.

North America.

a. Adult. Boston. Presented by W. Winstone, Esq.

14. BLEEKERIA.

Body elongate, low, compressed, covered with scales of moderate size. One lateral line; skin without longitudinal folds. One long dorsal; anal of moderate length. Jaws and palate without teeth; lower jaw prominent. Gill-opening very wide, the gill-membranes not united; branchiostegals six; gills four, a cleft behind the fourth; pseudobranchiæ composed of lamellæ; air-bladder none.

Madras.

1. Bleekeria kallolepis.

B. 6. D. 40. A. 15. L. lat. 100. L. transv. 3/14.

Back olive-coloured, sides silvery.

Madras.

a. Fifty-five lines long. Presented by T. C. Jerdon, Esq.

Description.—Head and body strongly compressed. The depth of the body is less than one-half of the length of the head, which is one-fifth of the total. Form of the head as in *Ammodytes*, but with a larger eye, the diameter of which is contained five times and a half in the length of the head. Lower jaw very prominent; the maxillary extends nearly to the front margin of the orbit. I am unable to detect any teeth either in the jaws or on the palate. The intermaxillary is protractile, and the maxillary terminates in a small spine superiorly. Nostrils distant, situated in the middle of the length of the snout. Interorbital space narrow. Cheeks and opercles naked; the suboperculum is broad, striated and emarginate posteriorly.

The dorsal fin commences immediately behind the vertical from the root of the pectoral, and terminates at a distance from the caudal which nearly equals the length of the latter fin or two-thirds of that of the head. It is composed of simple articulated rays, the anterior of which can be received in a shallow groove; the middle are the longest, lower than the body. The vent is situated midway between the roots of the pectoral and of the caudal, and the anal commences immediately behind it, terminating opposite the dorsal. Caudal deeply forked, scaly at the base; its length is three-quarters of that of the head. The pectoral is inserted opposite the notch of the suboperculum, and its length equals the distance of the end of the operculum from the pupil.

The scales are arranged with great regularity, and much longer than high; their free surface is furrowed by concentric striæ, and by others radiating from the centre. Wherever the striæ cross each other, a minute nodule is produced; the margin is finely lobate, and the middle lobule is larger than the others, tooth-like. The lateral line runs near the base of the dorsal, and is bent downwards at the extremity of the tail, towards the middle of the caudal.

Fifth Group. CONGROGADINA.

No ventral fins whatever; vent remote from the head; gill-openings of moderate width, the gill-membranes being united below the throat, not attached to the isthmus.

15. CONGROGADUS.

Machærium[*], *Richards. Ann. & Mag. Nat. Hist.* 1843, xii. p. 175.

Body elongate, compressed, eel-like, covered with very small scales; vertical fins united, long; ventrals none. Cleft of the mouth of moderate width, with the lower jaw prominent. Jaws with a single series of small teeth, closely set; palate smooth. Branchiostegals six; gill-openings of moderate width, gill-membranes united below the throat, not attached to the isthmus; gills four, a slit behind the fourth; pseudobranchiæ well developed. Vent remote from the head. Air-bladder and pyloric appendages none.

Australian and East Indian coasts.

1. Congrogadus subducens.

Machærium subducens, *Richards. Ann. & Mag. Nat. Hist.* 1843, xii. p. 175. pl. 6, and *Voy. Ereb. & Terr. Fish.* p. 72. pl. 44. figs. 1–6.
—— reticulatum, *Bleek. Banka,* ii. p. 734.

B. 6. D. 71. C. 10. A. 60–65.

The height of the body is three-fifths of the length of the head, which is contained six times and a half to seven times in the total length. The dorsal fin commences above the end of the pectoral.

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[*] Preoccupied.

Each jaw on each side with more than forty small teeth. Body brownish, uniform or irregularly marbled or spotted; a black ocellus on the operculum; lower part of the cheeks with pearl-coloured spots; base of the dorsal and anal with bluish spots.

Coasts of Australia. Banka, Lepar.

a. Adult: skin. Port Essington.
b. Half-grown. Port Essington. Presented by the Earl of Derby.
c. Adult. Abrolhos.
d. Adult: stuffed. West Australia.—Type of the species.
e, f–h. Adult and half-grown. Australia. Presented by the Earl of Derby.
i. Half-grown. East Indian Archipelago. From Dr. v. Bleeker's Collection.

2. Congrogadus nebulatus.

Machærium nebulatum, *Bleek. Singapore*, p. 76.

B. 6. D. 77. C. 10. A. 65.

The length of the head is contained eight times and a third in the total. The dorsal fin commences above the end of the pectoral. Each jaw on each side with about twenty-five teeth. Green, with irregular brown and blackish spots. (*Bleek.*)

Singapore.

16. HALIOPHIS.

Haliophis, *Rüpp. Atlas Fische*, p. 49.

Body elongate, compressed, naked. The dorsal and anal fins extend to the base of the caudal; ventrals none. Cleft of the mouth of moderate width, with the lower jaw longest. Each jaw with a series of curved teeth; no teeth on the vomerine and palatine bones. Branchiostegals four (?); gill-openings of moderate width *. Vent remote from the head. Pyloric appendages none. An air-bladder (?).

Red Sea.

1. Haliophis guttatus.

Rüppell, l. c. p. 49. taf. 12. fig. 2.

D. $\frac{1}{45}$. A. 40. C. 9.

The height of the body is three-fifths of the length of the head, which is one-fifth of the total (without caudal). A narrow membrane extends from the last dorsal and anal ray to the base of the caudal. Operculum terminating in a small spine. Brown: body and vertical fins with dark dots; a blackish-brown ocellus above the base of the pectoral; a yellow streak from the origin of the dorsal to the extremity of the snout. (*Rüpp.*)

Red Sea.

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* Rüppell says, "Apertura branchialis parva"; but, by a comparison of the figure, I am induced to suppose that, as in *Congrogadus*, the gill-opening is of moderate width, the gill-membranes being united below the throat, and not attached to the isthmus.

Fam. 5. MACRURIDÆ.

Gadoidei, pt., *Cuv.*, *Müll.*
Gadidæ, pt., *Owen.*
Macruridæ, *Richardson.*

Body terminating in a long, compressed, tapering tail, covered with spiny, keeled or striated scales. One short anterior dorsal, the second very long, continued to the end of the tail and composed of very feeble rays; anal of an extent similar to that of the second dorsal; no caudal. Ventral fins thoracic or jugular, composed of several rays. Pseudobranchiæ none; six or seven branchiostegals. Air-bladder present. Pyloric appendages numerous.

Temperate parts of the North Atlantic. Mediterranean. Japanese and Australian seas.

Synopsis of the Genera.

Scales of moderate size; snout produced, conical; mouth inferior	1. MACRURUS, p. 390.
Scales of moderate size; snout obtuse, obliquely truncated; cleft of the mouth lateral	2. CORYPHÆNOIDES, p. 395.
Scales very small	3. MALACOCEPHALUS, p. 396.

1. MACRURUS.

Macrourus, *Bloch*, i. p. 152.
Lepidoleprus, *Risso*, *Ichth. Nice*, p. 197.

Scales of moderate size, keeled or spiny. Snout produced, conical; mouth inferior. Head with rough ridges; the suborbital ring forms a strong lateral ridge, joined with, and supporting the angle of the præoperculum, which has a very distinct ridge. Teeth in a band, villiform or cardiform, without larger ones in the outer series; palate smooth. Ventral fins below, or immediately behind or before the pectorals. A barbel.

Mediterranean; temperate parts of the North Atlantic; Japan; Australia.

1. **Macrurus rupestris.**

Coryphæna rupestris, *Fabr. Faun. Grœnl.* p. 154; *L. Gm.* i. p. 1195.
Macrourus rupestris, *Bl.* i. p. 152. taf. 177; *Bl. Schn.* p. 103. tab. 26; *Nilss. Skand. Faun. Fisk.* p. 604.
—— fabricii, *Sundev. Vet. Akad. Handl.* 1840, p. 6.

D. 11 | 124. A. 148. V. 8.

Five series of scales between the first dorsal and the lateral line; each scale with a strong longitudinal keel, terminating in a point. The first ray of the first dorsal rounded at the base, denticulated only towards the top. Vent situated behind the vertical from the origin of the second dorsal. Snout projecting, triangular, as long as the eye.

Greenland; occasionally on the northern coasts of Scandinavia.

a, b. Twenty-five and thirty inches long: stuffed: not good state. Greenland.

2. Macrurus australis.

Lepidoleprus australis, *Richards. Proc. Zool. Soc.* 1839, p. 100.

D. 13 | 88. A. 87. V. 7. L. lat. ca 130. L. transv. 4/15.
Vert. 14/53.

Each scale with twelve or thirteen keels, and with the margin crenulated. The second dorsal ray smooth, extending beyond the origin of the second dorsal fin, if laid backwards. Vent situated behind the vertical from the last ray of the first dorsal. The projecting part of the snout trihedral, scarcely longer than the diameter of the eye, which is rather less than one-third of the length of the head.

Port Arthur.

a. Type of the species. From the Haslar Collection.
b. Adult: stuffed: bad state.

Description.—The head is rather compressed; its length is equal to the distance between the first and twenty-third rays of the anal fin; its depth is much more than its width, two-thirds of its length. The projecting part of the snout is trihedral, not depressed, with a ridge along the middle of its upper surface. The ridges on the head are very obtuse, the most distinct being that running from the snout to the angle of the præoperculum; it is formed by the same bones as in *M. atlanticus*. The whole head is covered by small plates, the surface of which is provided with small spines; the opercles are scaly. The interorbital space is nearly flat, and its width is a little more than the vertical diameter of the eye. The nostrils are immediately before the eye, very close together, the posterior being a wide ovate slit. The cleft of the mouth is longer than wide, situated entirely at the lower side of the head, the symphysis of the lower jaw being in the same vertical with the anterior nostril. The upper jaw is protractile in a vertical direction. Each jaw with a band of coarse villiform teeth; lower jaw with a slender barbel, equal in length to the vertical diameter of the eye.

The angle of the præoperculum is rounded, slightly produced, but not extending so far backwards as that of the operculum. Suboperculum subvertical, slightly emarginate posteriorly. Gill-opening of moderate width, closed superiorly; the gill-membrane attached to the isthmus. Six branchiostegals; four gills, a slit behind the fourth; pseudobranchiæ none.

The height of the body is equal to three-quarters of the length of the head; the tail is compressed, tapering to a point, so that the length of the head enters nearly five times in the total. The first dorsal commences at a short distance from the occiput; its distance from the nostril equals the length of the head; its length is rather less than one-half of the height of the second (longest) ray: the first ray is quite rudimentary; the second is smooth, slender, equal in length to the distance from the anterior margin of the orbit to the angle of the operculum. The dorsal fins are close together, the distance between them being less than the length of the base of the first, or the second dorsal commences in the vertical from the nineteenth scale of the lateral line. Rays of the second dorsal very feeble, simple, shorter than the barbel. The anal fin commences immediately behind the vent, in the vertical from the seventeenth scale of the lateral line; the longest rays are in the middle of the fin, where their length is equal to two-fifths of that of the head. The pectoral is inserted below the middle of the depth of the body, with a narrow base; it is more than half as long as the head, and composed of fourteen rays. The root of the ventral falls immediately behind that of the pectoral; it is shorter than that fin, its outer ray being slightly produced.

The scales are subquadrangular, higher than long; their free portion, which is nearly one-half of the whole scale, is deeply ridged, the ridges radiating from the centre, and causing incisions on the margin. The lateral line is formed by a smooth groove, dividing each scale into two.

The typical specimen is discoloured, and nearly 17 inches long.

3. Macrurus cœlorhynchus.

Lepidoleprus cœlorhynchus, *Risso, Ichth. Nice,* p. 200. pl. 7. fig. 22 (very bad), and *Eur. Mérid.* iii. p. 244.

Giorna, Mem. Accad. Torin. 1805, p. 18. tab. 1. figs. 3 & 4.

Macrourus cœlorhynchus, *Bonap. Faun. Ital. Pesce.* (pl. M. mysticetus).

D. 9 | 68. A. 83. V. 7.

Five series of scales between the first dorsal and the lateral line. Scales without keel, with the surface spiny. The second dorsal ray smooth anteriorly, extending to, or nearly to, the origin of the second dorsal, if laid backwards. Vent situated behind the vertical from the last ray of the first dorsal. The second dorsal commences above the fifth anal ray. Snout about as long as the diameter of the eye.

Mediterranean.

4. Macrurus atlanticus.

Lowe, Proc. Zool. Soc. 1839, p. 88.

D. 11 | (ca) 100. A. ca 110. V. 7. Vert. 12/61.

Five series of scales between the first dorsal and the lateral line, and fifteen between the latter and the vent. Scales without keel, with the surface spiny. The second dorsal ray smooth anteriorly, extending to, or rather beyond, the origin of the second dorsal, if laid backwards. Vent situated behind the vertical from the last ray of the first dorsal. The projecting part of the snout broad, triangular, not longer than the diameter of the eye, which is one-third of the length of the head.

Sea of Madeira.

a, b, c–d. Adult, half-grown, and young. Madeira. Presented by the Rev. R. T. Lowe and J. Y. Johnson, Esq.
e. Adult: skeleton. Presented by the Rev. R. T. Lowe.

Description.—The length of the head equals the distance between the first and twenty-eighth rays of the anal fin, its depth being more than its width, and contained once and four-fifths in its length. The projecting part of the snout is triangular, somewhat depressed, with a ridge along the middle of its upper surface; its lateral edge is continued into a ridge formed by the suborbital ring, one part of which is joined to the angle of the præoperculum as in the *Scorpænidæ* and *Cottidæ*. Another ridge forms the upper margin of the orbit, is bifurcate anteriorly, to receive the nostrils into the fork, and extends backwards to the upper part of the gill-opening. There is another low ridge on each side of the crown. All these ridges leave spacious muciferous cavities between them, and are covered, like the remainder of the head, with hard, subimbricate spiny plates, the spines not being larger than those of the scales of the body. The interorbital space is very slightly concave, and its width equals the vertical diameter of the eye. The nostrils are immediately before the eye, very close together, the posterior being a wide ovate slit.

The cleft of the mouth is much longer than broad, situated entirely at the lower side of the head, the symphysis of the lower jaw being in the same vertical with the front margin of the orbit. The upper jaw is protractile in a vertical direction. Each jaw with a narrow band of villiform teeth; lower jaw with a slender barbel, half as long as the eye.

The angle of the præoperculum is produced backwards, rounded, nearly in the same vertical as the angle of the operculum, which points obliquely upwards. The edge between the angles of the operculum and præoperculum is emarginate. The gill-opening is of moderate width, closed superiorly; the gill-membrane attached to the isthmus. Six branchiostegals; four gills, a slit behind the fourth; pseudobranchiæ none.

The height of the body is more than one-half of the length of the head; the tail is compressed, tapering to a point, so that the length of the head is nearly one-fifth of the total. The first dorsal commences at a short distance from the occiput; its distance from the anterior nostril equals the length of the head; its length is two-fifths of the height of the second (longest) ray; the first ray is quite rudimentary. The distance between the two dorsal fins is twice the length of the base of the first, or the second dorsal commences in the vertical from the twentieth scale of the lateral line. The second ray of the first dorsal is smooth and rather feeble, its length being nearly two-thirds of that of the head. Rays of the second dorsal very feeble, simple, shorter than the barbel. The anal fin commences immediately behind the vent, in the vertical from the twelfth scale of the lateral line; the longest rays are in the middle of the fin, where they equal in length the horizontal diameter of the orbit. The pectoral is inserted below the middle of the depth of the body, with a narrow base; it is more than half as long as the head, and composed of eighteen rays. The insertion of the ventral is scarcely before that of the pectoral; it is shorter than the pectoral, its outer ray being slightly produced.

The scales are irregularly polygonal, of moderate size; their free portion, which forms a quarter of the whole scale, is covered with small spines. The lateral line, which is nearly straight, is formed by a smooth groove, dividing each scale into two.

Uniform brown: fins and belly blackish; the basal portion of the anal transparent.

Skeleton.—The bones of the skull are very thin, transparent, flexible, the rough external covering not being a part of the endoskeleton, from which it may be easily detached. The occipital crest is not very prominent above the level of the skull; a pair of lateral ridges run from the orbital portion of the principal frontal bones towards the scapulary region. The interorbital space is broad, deeply convex; a crest, not contiguous with the occipital, runs along its middle, and is continued on over the ethmoid to the end of the snout. The ethmoid is nearly entirely free, and forms the extremity of the snout. Orbit very large. The suborbital bones are very broad, curved, forming a broad channel; the hindmost is attached to the præoperculum, the ridge of which is continuous with that of the suborbital ring. The jaw-bones are entirely at the lower side of the head, the processes of the intermaxillaries having a vertical position. Lower jaw with a deep muciferous channel. Operculum small, triangular, with the lower side deeply emarginate.

There are twelve abdominal vertebræ, this portion of the vertebral column being shorter than the head; the transverse processes of the abdominal vertebræ are moderately elongate and dilated.

In that portion of the tail which is preserved there are fifty-one vertebræ, and we should say that about ten vertebræ have been lost.

5. Macrurus sclerorhynchus.

Valenc. in Webb & Berthel. Iles Canar. p. 80. pl. 14. fig. 1 (from a stuffed specimen).

D. 11 | 87. A. 72.

A vertical series below the first dorsal contains twenty-six or twenty-eight scales, five of which appear to be above the lateral line. Scales spiny, the spines being arranged in series; the spines of the middle series are the largest, and form together a sort of keel. The second dorsal ray is denticulated anteriorly, extending far beyond the origin of the second dorsal, if laid backwards. Vent situated behind the vertical from the last ray of the first dorsal. The projecting part of the snout is trihedral, shorter than the diameter of the eye, which is two-fifths of the length of the head.

Lanzarote.

The typical specimen, from which these characters are taken, is $0^{m}\cdot180$ long.

6. Macrurus macrolepidotus.

Kaup in Wiegm. Arch. 1858, p. 91.

D. 11 | . . . A. . . . V. 7.

Twelve scales between the vent and the dorsal line; scales with fourteen or fifteen ribs, each rib armed with spines. The longest rays of the anterior dorsal extend to the seventh ray of the posterior, if laid backwards. (*Kaup.*)

Hab. —— ?

7. Macrurus trachyrhynchus.

Giorna, Mem. Accad. Torin. 1805, p. 18. pl. 1. figs. 1 & 2.
Lepidoleprus trachyrhynchus, *Risso, Ichth. Nice,* p. 197. pl. 7. fig. 21 (very bad), and *Eur. Mérid.* iii. p. 243.

B. 7. D. 11 | 110. A. 95. V. 6.

Scales spiny. Dorsal fins close together; scales along the base of the dorsal and anal fins forming a sheath with projecting spines. Ventrals inserted a little before the pectorals. Snout much produced, pointed. Inside of mouth blackish. (*Risso.*)

Mediterranean.

8. Macrurus japonicus.

Macrourus japonicus, *Schleg. Faun. Japon. Poiss.* p. 256. pl. 112. fig. 2.

B. 6. D. 11 | ca 80. A. 77. V. 7.

About five series of scales between the first dorsal and the lateral line; each scale with three to five keels terminating in trenchant spines. The second dorsal ray is rather feeble, smooth, and extends to the origin of the second dorsal fin, if laid backwards. Vent situated below the middle of the distance between the two dorsals. Ventrals thoracic. The length of the head is contained four times and two-thirds in the total. Snout much produced, spatulate, pointed, its length being contained twice and a fifth in that of the head. The width of the interorbital space is three-quarters of the horizontal diameter of the eye, which is one-fourth of the length of the head.

Japan.

a–b. Heads, in spirits. Japan.

2. CORYPHÆNOIDES.

Coryphænoides, *Gunner, Trondhj. Selsk. Skrift.* iii. p. 50.
Macrourus, sp., *Auct.*

Scales of moderate size, spiny or smooth. Snout short, obtuse, obliquely truncated; cleft of the mouth lateral. Head without prominent ridges; the suborbital ring is not joined to the angle of the præoperculum, nor is the latter supported by it. Præopercular angle with a very indistinct ridge. Teeth in the upper jaw in a narrow band, those of the outer series larger than the others; palate smooth. Ventrals below the pectorals. A barbel.

From Scandinavia to Madeira. Australia.

1. Coryphænoides norvegicus.

Berg-lax, *Ström, Söndm.* i. p. 267.
Coryphænoides rupestris, *Gunner, Trondhj. Selsk. Skrift.* iii. p. 50. tab. 3. fig. 1.
Lepidoleprus norwegicus, *Nilss. Prodr.* p. 51 (1832).
Macrourus strömii, *Reinh. in Dansk Vidensk. Selsk. Afhandl.* vii. p. 129; *Sundev. Vet. Akad. Handl.* 1840, p. 1; *Gaimard, Voy. Scand. Poiss.* pl. 11.
Macrourus norwegicus, *Nilss. Skand. Faun. Fisk.* p. 600.

D. 11 | . . . A. . . . V. 8.

Four or five series of scales between the first dorsal and the lateral line; scales without keel, and with the surface spiny. The first ray of the first dorsal with a compressed edge anteriorly, which is armed with teeth directed upwards. Vent situated before the vertical from the origin of the second dorsal. Snout obtuse.

Western and northern coasts of Norway.

2. Coryphænoides serratus.

Macrourus serratus, *Lowe, Proc. Zool. Soc.* 1843, p. 91.

B. 7. D. 10 | ca 100. A. 80–90. V. 8.

Scales with radiating striæ, without keel or spines. The first ray of the first dorsal strong, serrated. Snout short; head without ridges. (*Lowe.*)

Sea of Madeira.

3. Coryphænoides denticulatus.

Macrourus denticulatus, *Richards. Voy. Ereb. & Terr. Fish.* p. 53. pl. 32. figs. 1–3.

D. 11 | . . . A. . . . V. 8.

Five series of scales between the anterior dorsal and the lateral line; scales spiny. The first dorsal ray very slender, and not serrated. Snout very short and obtuse; head without ridges. Teeth in the upper jaw in a very narrow band, those of the outer series being much stronger and widely set. The vent is situated vertically behind the anterior dorsal.

South Australia.

a. Dried: very bad state. Presented by Sir J. Richardson.—Type of the species.

3. MALACOCEPHALUS.

Scales very small, rough. Snout short, obtuse, obliquely truncated; cleft of the mouth lateral. Head without prominent ridges; the suborbital ring is not joined to the angle of the præoperculum, nor is the latter supported by it. Præopercular angle with a very indistinct ridge. Teeth in the upper jaw in two series, those in the inner being minute; palate smooth. Ventrals jugular. A barbel.

Madeira.

1. Malacocephalus lævis.

Macrourus lævis, *Lowe, Proc. Zool. Soc.* 1843, p. 92.

D. 14 | ca 200. A. ca 200. V. 8.

The second dorsal ray slender, smooth. Axil, ventrals, and the region before the ventrals black.

Sea of Madeira.

a. Nineteen inches long. Presented by the Rev. R. T. Lowe.—Type of the species.

b. Half-grown. Presented by J. Y. Johnson, Esq.

Description.—Head large, rather short, somewhat compressed, two-thirds as wide as high, its greatest depth being three-quarters of its length. It is covered all over with minute rough scales and with a tough skin, which barely allows the ridges of the skull to be visible externally. The bones of the head too are very thin and fragile, and scarcely projecting on the surface. The length of the head equals the distance between the first and fortieth rays of the anal fin. Snout short, obtuse, obliquely truncated anteriorly, one-half or two-thirds as long as the diameter of the orbit, which is nearly one-third of the length of the head. Cleft of the mouth lateral, wide, oblique, the maxillary extending nearly to the vertical from the posterior margin of the eye. Both jaws are armed with a series of rather small widely-set teeth; there is a second inner series of small teeth in the upper jaw; vomer smooth. Barbel very slender, nearly as long as the eye. Nostrils close together, immediately before the eye. Interorbital space flattish, as wide as the orbit.

Angle of the præoperculum produced backwards, rounded; operculum with a short stiff spine pointing obliquely upwards; there is another small spine at a short distance above it, directed upwards, and apparently belonging to the humerus. Suboperculum vertical, intercalated between operculum and præoperculum. Seven branchiostegals; gill-membranes not attached to the isthmus, united by a narrow cutaneous bridge. Gills four, a slit behind the fourth; pseudobranchiæ none. The membrane coating the inner side of the gill-cavity forms a fold fixed to the outer gill, by which a portion of the cavity is separated.

The depth of the body below the anterior dorsal equals the length of the head, the snout not included. The trunk is very short, shorter than the head, and the vent is situated in the vertical from the root of the pectoral. The tail tapers to a very long and narrow band, so that the length of the head is rather less than one-sixth of the total.

The anterior dorsal commences in the vertical from the root of the pectoral, and is at least twice as high as long, the length of its second ray being two-thirds of that of the head; the first ray is quite rudimentary. The origin of the second dorsal is very indistinct, the rays of its anterior portion being quite rudimentary and scarcely visible; its distance from the first dorsal appears to be equal to the height of the latter. The rays in its posterior portion are more distinct, yet exceedingly feeble and very short. The anal fin commences immediately behind the vent, below the posterior half of the first dorsal; its rays are very closely set, and shorter than the diameter of the eye. The pectoral is inserted in the upper half of the depth of the body, and its length is nearly two-thirds of that of the head. Ventrals close together, rather short, distinctly jugular.

Scales very small, rough.

Brownish: margins of the opercles shining silvery; axil, ventrals, and the region before them black; dorsal and pectoral blackish; anal with a black edge. Inside of the mouth white, of the gill-cavity black.

Fam. 6. ATELEOPODIDÆ.

Body terminating in a long, compressed, tapering tail, naked. One short anterior dorsal and no other; anal very long, continuous with the caudal. Ventrals reduced to simple filaments, attached to the humeral arch.

1. ATELEOPUS.

Ateleopus, *Schleg. Faun. Japon. Poiss.* p. 255.

Head with the snout much protruding and obtusely rounded, the cleft of the mouth being at the lower side of the head; maxillaries protractile in a downward direction.. Body and tail compressed, elongate, naked. One short dorsal, the rudimentary second dorsal of the Macruridæ having entirely disappeared; one long anal, continued on to the caudal. Ventral reduced to a filament which is composed internally of two rays, intimately connected by a common membrane; this fin is inserted at the symphysis of the humeri. Teeth in the jaws villiform, in bands; vomer and palatine bones smooth.

Japan.

1. Ateleopus japonicus.

Ateleopus, *Schleg. l. c.* pl. 112. fig. 1.

Ateleopus japonicus, *Bleek. Verhand. Batav. Genootsch.* xxv. *Nalez. Jap.* p. 19.

B. 8. D. 8. A. 108. C. 10. P. 12. V. 1.

The height of the body is contained nine times in the total length, the length of the head seven times and a third. The length of the snout is contained twice and three-fourths in that of the head; eye small. The vent is situated at the end of the anterior third of the total length. The dorsal fin commences in the same vertical with the pectoral. Ventrals one-sixth shorter than the head. Brownish. (*Schleg.*)

Bay of Oomura.

Appendix to the Anacanthini gadoidei.

XENOCEPHALUS.

Xenocephalus, *Kaup in Wiegm. Arch.* 1858, p. 85.

Head very large, truncated, cuirassed with plates and armed with spines; body small. Only one dorsal and anal, separated from the caudal by a small interspace. Vent in the posterior half of the body. Small teeth in the jaws; none on the vomer or the palatine bones.

New Ireland.

1. Xenocephalus armatus.

Kaup, l. c. p. 86.

D. 7. A. 10. C. 20. P. 21. V. 5.

Caudal fin large. Shields on the head yellowish-brown, the naked skin between them blackish. Body dark-brown, with black spots on the back; belly shining golden; fins yellowish-white. (*Kaup.*)

New Ireland.

Fam. 7. PLEURONECTIDÆ.

Poissons plats, *Cuv. Règne Anim.*
Pleuronectidæ, *Fleming, Brit. Anim.* p. 178.
Heterosomata, *Bonaparte.*

Body strongly compressed, flat, with one of the two sides, which is always turned upwards, coloured, whilst the other is colourless and only sometimes spotted. Both eyes are placed on the coloured side; and although the bones are present on both sides of the skull, they are not equally developed or symmetrical *. Dorsal and anal fins exceedingly long, without divisions †. Gills four; pseudobranchiæ well developed; air-bladder none.

Carnivorous fishes, living on the sandy bottom of the coasts of all the regions; many ascend rivers.

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* This is unique in the division of Vertebrate animals.

† A Pleuronectoid from the Pacific appears to form a remarkable exception, having the dorsal fin composed of two portions differing in structure. However, as this fish is known from a drawing only, we do not venture to propose a generic appellation for it, and insert only the following abstract:—

Hippoglossus kingii, *Jenyns, Zool. Beagle, Fish.* p. 138. pl. 26.

D. 18+48. A. 51.

The dorsal fin commences anteriorly to the upper eye, and its anterior eighteen rays are much lower than the following, apparently forming a distinct portion. Eyes on the left side, rather distant from each other. The height of the body is one-half of the total length (without caudal). Lateral line with a subsemicircular curve above the pectoral. Uniform light brown. (*Jen.*)

Valparaiso.

Synopsis of the Genera.

I. *The jaws and the dentition are nearly equally developed on both sides.*

A. The dorsal fin commences on the neck ... 1. Psettodes, p. 401.

B. The dorsal fin commences above the eye.

- Eyes on the right side; teeth of the upper jaw in two series .... 2. Hippoglossus, p. 402.
- Eyes on the right side; teeth small, in a single series .... 3. Hippoglossoides, p. 405.
- Eyes on the left side; teeth villiform ...... 4. Tephritis, p. 406.

C. The dorsal fin commences before the eye, on the snout.

- Eyes on the left side; teeth of the jaws forming a band; vomerine teeth .... 5. Rhombus, p. 407.
- Eyes on the left side, close together; teeth of the jaws forming a band; vomerine teeth none .... 6. Phrynorhombus, p. 414.
- Eyes on the left side; teeth small, in a single series; vomerine teeth none. Scales deciduous .... 7. Arnoglossus, p. 415.
- Eyes on the left side; teeth of the upper jaw in two series, with the addition of canine-like teeth; vomerine teeth ...... 8. Citharus, p. 418.
- Eyes on the right side. Scales of moderate size; lateral line straight .... 9. Brachypleura, p. 419.
- Eyes on the right side. Scales small. Fins prolonged .... 10. Samaris, p. 419.
- Eyes on the right side. Scales small; lateral line without curve. Fins not prolonged .... 11. Psettichthys, p. 420.
- Eyes on the left side; teeth in a single series, of unequal size; vomerine teeth none; lateral line straight .... 12. Citharichthys, p. 420.
- Eyes on the left side; teeth of the upper jaw in a double series, with canines; vomerine teeth none; lateral line nearly straight .... 13. Hemirhombus, p. 422.
- Eyes on the left side; interorbital space not concave; teeth in a single series, unequal in size; vomerine teeth none; lateral line with a strong curve............ 14. Pseudorhombus, p. 423.
- Eyes on the right side; lateral line with a strong curve .... 15. Paralichthys, p. 431.
- Eyes on the left side, more or less distant from each other; interorbital space concave; teeth in a single or double series; lateral line with a strong curve............ 16. Rhomboidichthys, p. 431.

II. *Cleft of the mouth narrow, with the dentition much more developed on the blind side than on the coloured.*

A. The upper eye is not in advance of the lower; both pectorals present.

- The dorsal commences above the eye; teeth of moderate size .... 17. Pleuronectes, p. 438.

The dorsal commences above the eye; teeth minute	18. Parophrys, p. 454.
The dorsal commences on the snout; teeth minute; lateral line with a strong curve.	19. Psammodiscus, p. 457.
The dorsal commences on the foremost part of the snout; two ventrals; teeth villiform, forming bands	20. Ammotretis, p. 458.
The dorsal commences on the foremost part of the snout; one ventral only	21. Rhombosolea, p. 458.
The dorsal commences on the foremost part of the snout; two ventrals; teeth minute, in two series	22. Peltorhamphus, p. 460.

B. The eyes are developed and on the right side, the upper in advance of the lower; body scaly; pectorals sometimes rudimentary or absent.

* Vertical fins not confluent.

Scales small, ctenoid	23. Solea, p. 462.
Scales not ciliated; dorsal and anal rays scaly	24. Pardachirus, p. 478.
Scales not ciliated; dorsal and anal rays naked	25. Liachirus, p. 479.

** Vertical fins confluent.

Scales ctenoid	26. Synaptura, p. 480.
Scales not ciliated	27. Æsopia, p. 487.

C. The eyes are developed and on the right side, the lower not in advance of the upper; body scaleless.

Caudal free	28. Gymnachirus, p. 488.

D. Eyes rudimentary.

Vertical fins not confluent	29. Soleotalpa, p. 489.
Vertical fins confluent	30. Apionichthys, p. 489.

E. Eyes on the left side; pectorals none.

One lateral line	31. Ammopleurops, p. 490.
Lateral line none	32. Aphoristia, p. 490.
Lateral line double or triple on the left side; lips with tentacles	33. Plagusia, p. 491.
Lateral line double or triple on the left side; lips not fringed	34. Cynoglossus, p. 492.

1. PSETTODES *

Hippoglossus, sp., *Auct.*
Psettodes, *Benn. Proc. Comm. Zool. Soc.* i. 1831, p. 147.

Mouth very wide, the length of the maxillary being more than one-half of that of the head. Each jaw armed with two series of long, slender, curved, distant teeth, the front teeth of the inner series of the lower jaw being the longest, and received in a groove before the vomer; vomerine and palatine teeth. The dorsal fin commences on the nape of the neck; most of the rays of the dorsal and anal are branched. Scales rather small, ciliated. Gill-membranes scarcely united at the throat; gill-rakers proper none, replaced by groups of minute spines.

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* 1. Hippoglossus goniographicus, *Richards. Ichth. Chin.* p. 279.—China.

Indian Seas. ? West coast of Africa.

1. Psettodes erumei.

Pleuronectes erumei, *Bl. Schn.* p. 150.
Adalah, *Russell*, i. p. 54. pl. 69.
Nooree nalakah, *Russell*, i. p. 60. pl. 77.
Hippoglossus erumei, *Cuv. Règne Anim.*; *Rüpp. Atl. Fische*, p. 121, and *N. W. Fische*, p. 84; *Cant. Catal.* p. 216; *Bleek. Verh. Batav. Genootsch.* xxiv. *Pleuron.* p. 13.
—— nalaka, *Cuv. Règne Anim.*
—— dentex, *Richards. Voy. Sulph. Fish.* p. 102. pl. 47.
—— orthorhynchus, *Richards. Ichth. Chin.* p. 278.
? Psettodes belcheri, *Benn. Proc. Comm. Zool. Soc.* 1831, p. 147.

D. 47–53. A. 35–41. L. lat. 75.

The lateral line descends gradually from the shoulder to its straight portion, which commences behind the extremity of the pectoral. Brownish or blackish; dorsal and anal edged with white; caudal generally with a broad whitish band across its base. Young individuals sometimes with four broad dark-brown cross-bands.

From the Red Sea, through all the Indian Seas, to the coasts of China. ? West coast of Africa.

α. Eyes on the left side.

a. Adult: stuffed.
b. Half-grown. Singapore. From the Collection of the East India Company.
c. Half-grown: skin. Pinang. From Dr. Cantor's Collection.
d. Half-grown: bad state. Japan. Purchased of Mr. Frank.

β. Eyes on the right side.

e. Fine specimen. China. Presented by J. Reeves, Esq.
f. Young. Amboyna. Purchased of Mr. Frank.
g. Half-grown: skin. Pinang. From Dr. Cantor's Collection.
h. Adult. India. Presented by General Hardwicke.

γ. Variety with cross-bands; eyes on the left side.

i. Half-grown: skin. Pinang. From Dr. Cantor's Collection.

2. HIPPOGLOSSUS.

Hippoglossus, sp., *Cuv. Règne Anim.*

Eyes on the right side; mouth wide, the length of the maxillary being one-third, or not much more than one-third, of that of the head. Teeth in the upper jaw in a double series; the anterior of the upper jaw and the lateral of the lower strong; palatine and vomerine teeth none. The dorsal fin commences above the eye; all, or nearly all, the rays of the dorsal and anal fins simple. Scales very small, not ciliated. Gill-rakers short, compressed, widely set.

North Atlantic. (? Coasts of California and Kamtschatka.)

Bleeker (Compt. Rend. Acad. Sc. Amsterd. xiii. 1862, Pleuron.) divides this genus into two:—

1. Lateral line curved; the lower pharyngeal teeth in two rows: *Hippoglossus.*
2. Lateral line not curved; the lower pharyngeal teeth in one row: *Platysomatichthys.*

1. Lateral line curved.

1. Hippoglossus vulgaris.

The Holibut. Hälleflundra. Die Heilbutte.

Hippoglossus, *Rondel.* xi. c. 16. p. 325; *Willughby*, p. 99. tab. F. 6; *Ray, Syn.* p. 33; *Gesner*, pp. 669, 787; *Aldrov.* ii. c. 43. p. 238.

Passerum genus majus, *Schonev.* p. 62.

Pleuronectes, sp., *Artedi, Synon.* p. 31. no. 3, and *Gen.* p. 17. no. 3; *Gronov. Zoophyl.* no. 247.

Passer, sp., *Klein, Pisc. Miss.* iv. p. 33. no. 2.

Helleflynder, *Pontop. Norges Nat. Hist.* ii. p. 220; *Ström, Söndm.* i. p. 300.

Pleuronectes hippoglossus, *L. Syst. Nat.* i p. 456; *Bl. Fische Deutschl.* ii. p. 47. tab. 47; *Bl. Schn.* p. 147; *Lacép.* iv. p. 601; *Donov. Brit. Fish.* iv. pl. 75; *Pall. Zoogr. Ross.-As.* iii. p. 424; *Turt. Brit. Faun.* p. 95; *Faber, Fische Isl.* p. 148, and in *Isis*, 1828, p. 888; *Gronov. Syst. ed. Gray*, p. 87.

Holibut, *Penn. Brit. Zool.* iii. p. 198, and edit. 1812, iii. p. 302.

Fletan, *Duham. Pêches*, ii. sect. ix. p. 271. pl. 7. fig. 1.

Hippoglossus vulgaris, *Flem. Brit. An.* p. 199; *Jen. Man.* p. 460; *Yarr. Brit. Fish.* 2nd edit. ii. p. 321, 3rd edit. i. p. 630; *Parn. Wern. Mem.* vii. p. 372, or *Fish. Frith of Forth*, p. 212; *Nilss. Skand. Faun.* iv. p. 631.

—— maximus, *Gottsche in Wiegm. Arch.* 1835, p. 164.

? Hippoglossus vulgaris, *Ayres, Proc. Calif. Acad.* 1859, p. 30.

B. 7. D. 102–103. A. 74–81. Cæc. pyl. 4. Vert. 16/34.

Only the posterior dorsal and anal rays are bifid; the dorsal commences above the anterior third of the eye. Extremity of maxillary scaly. The height of the body is one-third of the total length (with the caudal), the length of the head two-ninths. The greatest depth between the anal fin and the lateral line equals the length of the head, without snout. Scales minute, not ciliated; interorbital space flat, naked, its width being equal to the vertical diameter of the eye. Lateral line with a strong curve above the pectoral, the depth of the curve being one-fourth of its width. Snout rather longer than the eye, the diameter of which is one-sixth or one-seventh of the length of the head. Lower jaw scarcely prominent; the length of the maxillary is one-third of that of the head. Teeth conical, pointed: upper jaw with two series, convergent posteriorly; the anterior teeth are the strongest and all separate from one another; the lower jaw with seven strong, widely-set teeth on each side. Front margins of the orbits on the same level. Fins naked; the distance of the dorsal from the caudal equals the depth of the free portion of the tail; the longest dorsal rays are in the middle of the fin, their length being two-fifths of that of the head; pectoral twice as long as the ventral and half as long as the head. No prominent spine before the anal. Gill-rakers short, compressed, triangular, widely set, not half as long as the eye. Yellowish-brown.

From the British Channel along the coasts of Northern Europe. (? California and coast of Kamtschatka.)

a. Fine specimen. London market.
b. Adult: stuffed. British.
c. Adult: stuffed. Frith of Forth.
d. Adult: stuffed. Devonshire. Presented by Lieut. H. F. Spence, R.N.
e. Half-grown: skin. From Gronow's Collection.
f. Skeleton, 5 feet long.

2. Lateral line not curved.

2. **Hippoglossus grœnlandicus.**

Pleuronectes hippoglossus, *Fabr. Faun. Grœnl.* p. 161; ? *Mitch. Lit. & Phil. Trans. New York,* i. p. 386 (not *L.*).
? Hippoglossus vulgaris, *Storer, Fish. Massach.* p. 145; *Dekay, New York Faun. Fish.* p. 294. pl. 49. fig. 157.
Hippoglossus pinguis, *Gaim. Voy. Scand. et Lap. Poiss.* pl. 22 (not *Fabr.*).

D. 100–102. A. 75.

Dorsal and anal rays simple; the dorsal commences above the posterior third of the eye. The height of the body is two-sevenths of the total length (with the caudal), the length of the head one-fourth. Scales very small, not ciliated; interorbital space flat, scaly, wider than the orbit. The lateral line descends gently in an oblique straight line above the pectoral, and is not curved. Snout more than twice as long as the orbit, the diameter of which is one-eighth of the length of the head. Lower jaw prominent; the length of the maxillary is two-fifths of that of the head. Teeth conical, pointed: upper jaw with two series, convergent posteriorly; those of the outer series become gradually smaller posteriorly; a pair of strong canine teeth anteriorly in the inner series, the other teeth of this series being very small. Lower jaw with a series of strong distant teeth. Front margins of the orbits on the same level. Fins naked; the distance of the dorsal from the caudal equals the depth of the free portion of the tail; the longest dorsal rays are behind the middle of the fin, their length being one-third of that of the head; length of the pectoral two-fifths of that of the head. No spine before the anal. Yellowish-brown.

Greenland.

a. Very young. Greenland. From Hr. Holböll's Collection.
b–e. Adult: stuffed. Greenland.

3. HIPPOGLOSSOIDES *

Hippoglossoides, *Gottsche in Wiegm. Arch.* 1835, p. 168.

Eyes on the right side; mouth wide, the length of the maxillary being more than one-third of that of the head. Teeth small, conical, in a single series; no teeth on the palate. The dorsal fin commences above the eye; dorsal and anal rays simple. Scales small, or rather small, ciliated; lateral line without anterior curvature.

Northern shores of the Atlantic.

1. Hippoglossoides limandoides.

The rough Dab or Sandsucker.

Pleuronectes limandoides, *Bl. Ausl. Fische*, iii. p. 24. tab. 106; *Bl Schn.* p. 146; *Gm. L.* i. p. 1232; *Lacép.* iv. p. 635; *Faber, Isis*, 1828, p. 878.

Isskädda, *Quensel in Vet. Akad. Handl.* 1806, p. 222.

Pleuronectes linguatula, *Müll. Prodr.* p. 377.

Hippoglossoides limanda, *Gottsche in Wiegm. Arch.* 1835, p. 168.

Pleuronectes limandanus, *Parnell in Edinb. New Philos. Journ.* 1835, p. 210.

Platessa limandoides, *Parn. Wern. Mem.* vii. p. 368. tab. 38, or *Fish. Frith of Forth*, p. 208. tab. 38; *Yarr. Brit. Fish.* 2nd edit. ii. p. 312, and 3rd edit. i. p. 625; *Jen. Man.* p. 459; *Fries och Ekstr. Skand. Fisk.* p. 117. pl. 27; *Nilss. Skand. Faun. Fisk.* p. 629.

B. 8. D. 82–87. A. 64–65. L. lat.100. Cæc. pylor. 4. Vert. 45.

The dorsal commences behind the anterior margin of the eye. Maxillary scaly. The height of the body is one-third of the total length (without caudal), the length of the head one-fourth. The greatest depth between the anal fin and the lateral line is less than the length of the head. Scales on the cheek not much smaller than those on the body; interorbital ridge very narrow, scaly; no spines or tubercles along the lateral line or the base of the dorsal and anal fins; lateral line scarcely bent upwards above the pectoral. Snout shorter than the orbit, the diameter of which is one-fourth of the length of the head. Lower jaw prominent; the length of the maxillary is two-fifths of that of the head. Teeth very small, conical, pointed, the front teeth in the upper jaw and a pair in front of the lower being the largest. Front margins of the eyes on the same level. Each fin-ray is accompanied by a series of very small rough scales; the distance of the dorsal from the caudal is rather less than the depth of the free portion of the tail; the longest dorsal rays are behind the middle of the fin, rather longer than the pectoral and nearly half as long as the head; ventral shorter than pectoral; no spine before the anal. Reddish-brown.

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* 1. Pleuronectes platessoides, *Fabr. Faun. Grœnl.* p. 164, and *Vidensk. Selsk. Naturv. och Mathem. Afhandl.* i. p. 50. tab. 2. fig. 2.—Citharus platessoides, *Reinh. Vidensk. Selsk. Naturv. och Math. Afhandl.* vii. p. 130; *Gaim. Voy. Scand. et Lap. Poiss.* pl. 21.—Greenland. Perhaps identical with *H. limandoides*.

From the British Channel along the shores of Northern Europe.

a–e. Adult and young: skins. Frith of Forth. From Dr. Parnell's Collection.
f. Half-grown: skin. Brixham. From Dr. Parnell's Collection.
g. Adult: skin. London market. From Mr. Yarrell's Collection.

2. Hippoglossoides dentatus.

Pleuronectes dentata, *Mitch. in Lit. & Phil. Trans. New York*, i. p. 390 (not *L.*).
Platessa dentata, *Storer, Fish. Massach.* p. 143, cop. by *Dekay, New York Fauna, Fish.* p. 298.

D. 91. A. 70.

The dorsal commences above the middle of the eye. The height of the body is one-half of the total length (without caudal), the length of the head one-fourth. The lateral line is scarcely bent above the pectoral. Pectoral half as long as the head. Reddish-brown.

Atlantic coasts of the United States.

4. TEPHRITIS.

Platessa, sp., *Gray, Richards.*

Eyes on the left side. Mouth wide, the length of the maxillary being more than one-third of that of the head. Each jaw with a band of villiform teeth; vomerine or palatine teeth none. The dorsal fin commences above the eye; all the dorsal and anal rays branched. Scales rather small. Gill-membranes broadly united at the throat; gill-rakers short, broad, crenulated. Branchiostegals seven.

Chinese Seas.

1. Tephritis sinensis.

Pleuronectes sinensis, *Lacép.* iv. pp. 595, 638. pl. 14. fig. 1 (very bad).
Platessa chinensis, *Gray, Ind. Zool.* pl. . fig. 1; *Richards. Ichth. Chin.* p. 277.
—— velafracta, *Richards. l. c.* p. 278.

D. 46. A. 35. L. lat. 80.

The height of the body is nearly one-half of the total length (without caudal), the length of the head two-sevenths. Scales ciliated; lateral line with a strong curve above the pectoral. Eyes very close together, separated by a very narrow, naked, concave space. The dorsal fin commences above the middle of the eye, and terminates at a distance from the caudal which is one-half of the free portion of the tail. Anterior dorsal rays widely set. Brownish, with scattered black or blue dots, edged with light-blue. Vertical fins with large brown spots.

Chinese Seas.

a–b. Adult and half-grown: stuffed. China. Presented by J. Reeves, Esq.

c. Fine specimen. From the Haslar Collection.

5. RHOMBUS*

Rhombus, sp., *Klein, Pisc. Miss.* iv. p. 34.
Rhombus et Zeugopterus, *Gottsche in Wiegm. Arch.* 1835, pp. 172, 178.

Eyes on the left side. Mouth wide, the length of the maxillary being more than one-third of that of the head. Each jaw with a narrow band of villiform teeth, without canines; vomerine teeth; none on the palatines. The dorsal fin commences on the snout; nearly all the dorsal and anal rays branched. Scales none or small. Gill-membranes scarcely united at the throat; gill-rakers well developed, lanceolate. Branchiostegals seven.

Mediterranean; North Atlantic.

This genus may be subdivided into three smaller groups:—

1. Ventral free from anal; scales none, or small and cycloid: *Rhombus*, Gottsche, p. 407.
2. Ventral free from anal; scales small and ciliated: *Lepidorhombus*, m., p. 411.
3. Ventrals united with anal: *Zeugopterus*, Gottsche, p. 413.

1. Ventral free from anal; scales none, or small and cycloid.

1. Rhombus maximus.

The Turbot. Stein-butt.
Ψῆττα, *Aristot.* iv. c. 11, v. c. 9, ix. c. 37; *Ælian*, iv. c. 3; *Oppian*, i. p. 5.
Rhombus, *Plin.* ix. c. 15, 20 & 42; *Bellon. De Aquat.* p. 139.
Rhombus aculeatus, *Rondel.* xi. c. 2. p. 310; *Gesner, Aquat.* iv. pp. 661 & 670; *Schonev. Ichth.* p. 60; *Aldrov.* ii. c. 48. p. 248; *Jonston*, i. c. 3. art. 2. punct. 2. p. 66. tab. 22. fig. 12; *Willughby*, p. 93. tab. F. 8. fig. 3; *Ray*, p. 32; *Klein, Pisc. Miss.* iv. p. 34. no. 1. tab. 8. fig. 1 & tab. 9. fig. 1.
Rhombus, sp., no. 2, *Klein, l. c.* p. 35. tab. 8. fig. 2.
Rhombus maximus, *Will.* p. 94. tab. F. 2; *Ray*, p. 31.
Pleuronectes, sp., *Artedi, Synon.* p. 32. no. 7, and *Genera*, p. 18. no. 9; *Gronov. Zoophyl.* no. 254, and *Mus.* ii. p. 10. no. 159.
Pleuronectes maximus, *L. Syst. Nat.* i. p. 459; *Brünn. Ichth. Mass.* p. 35; *Bl. Fische Deutschl.* ii. p. 53. tab. 49; *Bl. Schn.* p. 153; *Quensel in Vet. Akad. Handl.* 1806, p. 203; *Risso, Ichth. Nice*, p. 314; *Faber in Isis*, 1828, p. 892; *Donov. Brit. Fish.* ii. pl. 46; *Ekstr.*

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* 1. Rhombus torosus, *Rathke, Faun. Krym*, p. 349.—Sea of Azof.
2. —— cristatus, *Lowe, Proc. Zool. Soc.* 1839, p. 88.—Madeira.
3. —— candidissimus, *Risso, Eur. Mérid.* iii. p. 253. fig. 34.—Mediterranean.

Vet. Akad. Handl. 1834, p. 56, or *Fische Mörkö*, p. 250; *Flem. Brit. An.* p. 196; *Jen. Man.* p. 461.
Turbot, *Penn. Brit. Zool.* iii. p. 204, and edit. 1812, iii. p. 315. pl. 49.
Turbot, *Duham. Pêches*, iii. sect. 9. p. 261. pl. 3.
Pleuronectes turbot, *Lacép.* iv. p. 645.
Rhombus maximus, *Cuv. Règne Anim.*; *Risso, Eur. Mérid.* iii. p. 250; *Yarr. Brit. Fish.* 2nd edit. ii. p. 324, and 3rd edit. i. p. 634; *Parn. Wern. Mem.* vii. p. 373, or *Fish. Frith of Forth*, p. 213; *Bonap. Faun. Ital. Pesce*; *Nilss. Skand. Faun.* iv. p. 636; *Costa, Faun. Nap.* ii. p. 15; *Canestr. Arch. Zool.* i. p. 25. tav. 3. fig. 1.
Pleuronectes tuberculatus, *Shaw, Zool.* iv. p. 312; *Turt. Brit. Faun.* p. 97.
—— cyclops, *Donov.* iv. pl. 90.
Rhombus aculeatus, *Gottsche in Wiegm. Arch.* 1835, p. 172.
Pleuronectes rhombus, *Gronov. Syst. ed. Gray*, p. 90.

B. 7. D. 62–69. A. 45–50. Vert. 12/19. Cæc. pylor. 2.

The height of the body is contained once and three-fifths in the total length (without caudal), the length of the head three times. Scales none; body with scattered, conical, bony tubercles; those on the head are much smaller but more numerous, particularly between the orbits and behind the upper eye; interorbital space flattish, its width being equal to the vertical diameter ot the orbit; no scales on the fins. Lateral line with a semicircular curve above the pectoral. Lower jaw prominent; the length of the maxillary is two-fifths of that of the head. The lower eye is slightly in advance of the upper. The dorsal fin terminates close by the root of the caudal; its longest rays are a little behind the middle of the fin, nearly one-half of the length of the head, and longer than the pectoral. No spine before the anal; gill-rakers rather widely set, not quite so long as the eye, lanceolate. Greyish or brownish, sometimes spotted with darker.

Coasts of Europe.

a. Adult: skin. From Donovan's Collection.
b. Large specimen: stuffed. Presented by Lord Willoughby.
c. Adult: skin. Plymouth. From Mr. Yarrell's Collection.
d. Adult: stuffed. Devonshire. Presented by Lieut. H. F. Spence, R.N.
e. Half-grown: skin. South Devonshire. From Mr. Yarrell's Collection.
f–h. Adult and half-grown: stuffed. Frith of Forth.
i. Half-grown. Båhuslän. Presented by Hr. A. W. Malm.
k–m. Adult and half-grown: stuffed and skin.
n. Young: skin. From Gronow's Collection.
o. Young: fine specimen. From the Haslar Collection.
p–q. Young: not good state. (? Surinam.) Purchased of Mr. Frank.
r–s. Skeletons of large specimens. British.
t. Skull of a very large specimen. German Ocean. From Dr. A. Günther's Collection.

Skeleton.—The lateral edge of the parietal and frontal bones is considerably dilated; that on the left side is deeply emarginate anteriorly to receive the upper (right) eye; the osseous orbita of the upper eye is complete, formed by the frontal, whilst the lower eye lies in the temporal groove, unprotected by an infraorbital ring, of which only a small rudiment (a præorbital) exists. The occipital crest is of moderate height, bearing the interneurals of the anterior dorsal rays. All the bones forming the bottom of the temporal groove are well developed and ossified. The bones of the jaws are equally developed on both sides; there is a broad hiatus between the dentary and articulary of the mandible. The urohyal is very large, fixed between the symphysis of the lateral hyoids and that of the humeri; it is horseshoe-shaped, receiving the gill-membrane into its concavity. The pubic bones have a broad lengthened base for the insertion of the ventral fins, and are fixed by a long styliform process to the humeral bones.

There are twelve abdominal and nineteen caudal vertebræ; the neural and hæmal spines of the middle vertebræ are exceedingly long and strong, the first hæmal and interhæmal spine forming together a sort of pelvic bone. The length of the first hæmal spine equals that of the fourteen anterior vertebræ. Two interneurals and interhæmals always correspond to one neural and hæmal; sometimes a third interneural and interhæmal is intercalated. Parapophyses of the abdominal vertebræ broad, with feeble ribs and epipleurals.

2. Rhombus mæoticus.

Pleuronectes mæoticus, *Pall. Zoogr. Ross.-As.* iii. p. 419.
Rhombus stellosus, *Benn. Proc. Zool. Soc.* 1835, p. 92.
? Rhombus rhombitis, *Rathke, Faun. Krym*, p. 351.
Rhombus mæoticus, *Nordm. in Demid. Voy. Russ. Mérid. Poiss.* p. 534. pl. 28. fig. 1, pls. 29 & 30; *Kessler in Bull. Soc. Nat. Mosc.* 1859, pt. ii. p. 441.

D. 62–65. A. 46.

The height of the body is contained once and two-fifths in the total length (without caudal), the length of the head twice and two-thirds. Scales rudimentary, not imbricate. Body with more or less numerous, bony, conical tubercles, which are as large as the eye; those on the head and on the blind side are much smaller, numerous between the orbits and behind the upper eye; interorbital space flat, its width being equal to the vertical diameter of the orbit; no scales on the fins. Lateral line with a semicircular curve above the pectoral. Lower jaw prominent; the length of the maxillary is contained twice and a third in that of the head. The lower eye is slightly in advance of the upper. The dorsal fin terminates close by the root of the caudal; its longest rays are behind the middle of the fin, as long as the pectoral, and half as long as the head. Gill-rakers rather widely set, not quite so long as the eye, lanceolate. Brownish; body and fins mottled with reddish-brown.

Black Sea.

a. Fine specimen. Erzeroum. From the Collection of the Zoological Society.—Type of *Rh. stellosus*, Benn.

3. Rhombus lævis.

The Brill.

Rhombus lævis, *Rondel.* xi. c. 3. p. 312; *Gesner, Aquat.* iv. p. 663; *Aldrov.* ii. c. 48. p. 249; *Schonev.* p. 60; *Jonston,* i. c. 3. art. 2. punct. 2. p. 66. tab. 22. fig. 13; *Will.* p. 96; *Ray,* p. 32.
—— alter gallicus, *Bellon. De Aquat.* p. 141.
—— lævis verus, *Aldrov.* ii. c. 48. p. 250.
—— non aculeatus, *Will.* p. 95; *Ray,* p. 31.
Pleuronectes, sp., *Artedi, Synon.* p. 31. no. 5, and *Genera,* p. 18. no. 8.
Pleuronectes lævis, *L. Westg. Res.* p. 178.
—— rhombus, *L. Syst.* i. p. 458; *Brünn. Ichth. Mass.* p. 35; *Bl. Fische Deutschl.* ii. p. 36. taf. 43; *Bl. Schn.* p. 152; *Lacép.* iv. p. 649; *Donov. Brit. Fish.* iv. pl. 95; *Risso, Ichth. Nice,* p. 315; *Turton, Brit. Faun.* p. 97; *Flem. Brit. An.* p. 196; *Jen. Man.* p. 462.
Rhombus, no. 3, *Klein, Pisc. Miss.* iv. p. 35.
Pearl, *Penn. Brit. Zool.* iii. p. 208, and ed. 1812, iii. p. 321. pl. 50.
Barbue, *Duham. Pêches,* iii. sect. 9. cap. 1. p. 262. pl. 4.
Pleuronectes cristatus, *Licht. in Bl. Schn.* p. 153.
Rhombus vulgaris, *Cuv. Règne Anim.*; *Yarr. Brit. Fish.* 2nd edit. ii. p. 331, and 3rd edit. i. p. 641; *Parn. Wern. Mem.* vii. p. 375, or *Fish. Frith of Forth,* p. 215; *Costa, Faun. Nap.* ii. p. 10. tav. 42.
Pleuronectes lioderma, *Nardo, Ichth. Adr.* no. 132.
Rhombus barbatus, *Risso, Eur. Mérid.* iii. p. 251.
—— lævis, *Gottsche in Wiegm. Arch.* 1835, p. 175; *Bonap. Faun. Ital. Pesc.*; *Nilss. Skand. Faun. Fisk.* p. 638; *Canestr. Arch. Zool.* i. p. 27. tav. 2. fig. 4.
Pleuronectes passer, *Gronov. Syst. ed. Gray,* p. 90.

B. 7. D. 72–83. A. 53–61. Vert. 12/24.

The height of the body is contained once and five-sixths in the total length (without caudal), the length of the head three times. Scales very small, but distinct, covering the entire head, except the snout; interorbital space flat, its width being equal to the horizontal diameter of the eye, which is about one-eighth of the length of the head. Each fin-ray is accompanied by a series of minute scales. Lateral line with a subsemicircular curve above the pectoral. Lower jaw prominent; the length of the maxillary is two-fifths of that of the head. The lower eye is somewhat in advance of the upper. The dorsal fin terminates close by the root of the caudal; its anterior rays terminate in broad fringes, and its longest rays are behind the middle of the fin, somewhat longer than the pectoral, and two-fifths of the length of the head. No spine before the anal. Gill-rakers rather closely set, lanceolate, and not quite as long as the eye. Greyish-brown, with reddish-brown spots on body and fins.

Coasts of Europe.

a. Very fine specimen. Lisbon. Presented by the Rev. R. T. Lowe.
b. Fine specimen. Dalmatia.
c. Adult: stuffed. France. Purchased of M. Parzudaki.
d. Fine specimen. Brighton. Presented by Dr. A. Günther.
e–h. Young. Brighton. Presented by J. G. Children, Esq.
i–k. Adult and half-grown: skins. Plymouth. From Mr. Yarrell's Collection.

l. Twenty-seven inches long: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.
m–o. Half-grown and young: skins. From Mr. Yarrell's Collection.
p. Adult: stuffed. England.
q. Adult: stuffed. Frith of Forth.
r. Fine specimen. Båhuslän. Presented by Hr. A. W. Malm.
s–t. Half-grown: skins. From Gronow's Collection.
u. Adult: stuffed.
v. Adult: skeleton. British.

The *skeleton* is very similar to that of *Rh. maximus*; the vertical processes of the vertebræ are considerably shorter, the length of the first hæmal spine being equal to that of the eleven anterior vertebræ only.

4. Rhombus aquosus.

Pleuronectes maculatus, *Mitch. Report in part on the Fishes of New York*, p. 9; *Dekay, New York Faun. Fish.* p. 301. pl. 47. fig. 151.
—— aquosus, *Mitch. in Lit. & Phil. Trans. New York*, i. p. 389. pl. 2. fig. 3.
Rhombus aquosus, *Cuv. Règne Anim.*
? Rhombus aquosus, *Storer, Bost. Journ. Nat. Hist.* i. p. 351, and *Fish. Massach.* p. 146.

D. 63–65. A. 49–54. L. lat. 85.

The height of the body is contained once and two-thirds in the total length (without caudal), the length of the head thrice and a third. Scales small, smooth, covering the postorbital half of the head. Interorbital space naked, flattish, its width being rather less than the vertical diameter of the eye. Each fin-ray is accompanied by a series of minute scales. Lateral line with a subsemicircular curve above the pectoral. Lower jaw prominent; the length of the maxillary is two-fifths of that of the head. The lower eye is somewhat in advance of the upper. The dorsal fin terminates close by the root of the caudal; its anterior rays terminate in fringes, and its longest rays are behind the middle of the fin, their length being less than that of the pectoral, and more than one-half of that of the head. Gill-rakers closely set, slender, two-thirds as long as the eye. Brownish; back and vertical fins with darker spots.

Atlantic coasts of the United States.

a. Adult: skin. New York. From Dr. Parnell's Collection.
b. Fine specimen. N. America. Presented by the Smithsonian Institution.

2. Ventral free from anal; scales ciliated.

5. Rhombus megastoma.

The Whiff or Marysole. Sail-Fluke.
Passer cornubiensis, *Jago in Ray, Syn.* p. 163. fig. 2.
Whiff, *Penn. Brit. Zool.* iii. p. 209.
Pleuronectes, sp. 30, *Walb. Art.* iii. p. 120.

Rhombus cardina, pt., *Cuv. Règne Anim.*
Pleuronectes megastoma, *Donov. Brit. Fish.* iii. pl. 51; *Turt. Brit. Faun.* p. 97; *Flem. Brit. An.* p. 196; *Jen. Man.* p. 465; *Yarr. Brit. Fish.* 2nd edit. ii. p. 342, and 3rd edit. i. p. 654 (fig. bad); *Düben & Koren in Vet. Akad. Handl.* 1844, p. 102.
—— pseudopalus, *Hammer in Penn. Brit. Zool.* ed. 1812, iii. p. 324. pl. 52.
Carter, *Couch in Linn. Trans.* xiv. p. 78.
Rhombus megastoma, *Nilss. Skand. Faun. Fisk.* p. 641.
Zeugopterus (?) velivolans, *Richards. in Yarr. Brit. Fish.* 3rd edit. i. p. 656 *a* (fig. good).

B. 7. D. 85–87. A. 67–69. L. lat. 120. Vert. 11/30.

The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head thrice and a half. Scales rather small, with the posterior margin ciliated and rounded, covering nearly the whole head (the interorbital space and the maxillary included); interorbital space very narrow; the diameter of the eye is two-ninths of the length of the head. Each fin-ray is accompanied by a series of minute rough scales. Lateral line with a subsemicircular curve above the pectoral. Lower jaw prominent; the length of the maxillary is contained twice and a third in that of the head*. The lower eye is somewhat in advance of the upper. The dorsal fin terminates at a distance from the caudal which equals the depth of the free portion of the tail; its longest rays are at the commencement of the posterior third of the fin, where they are two-fifths of the length of the head, and somewhat shorter than the pectoral. No spine before the anal. Yellowish-brown.

Coasts of Great Britain; occasionally on the coasts of Ireland and Scandinavia.

a–h. Adult: skins and stuffed. British specimens.
i. Young: stuffed. English coast.
k. Adult: skeleton. British.

All the bones of this species are thinner and more slender than in *Rh. maximus* and in *Rh. lævis*; the length of the first interhæmal spine equals that of the nine anterior vertebræ.

6. Rhombus norvegicus.

Rhombus cardina, *Fries in Vet. Akad. Handl.* 1838, p. 184 (not syn.); *Nilss. Skand. Faun.* iv. p. 643.
Småhvarf, *Sundev. in Fries & Ekstr. Skand. Fisk.* p. 200. pl. 50.

D. 78–80. A. 58–64.

The height of the body is two-fifths of the total length (without caudal), the length of the head two-sevenths; the length of the maxillary is one-half of that of the latter, the diameter of the eye one-fourth. The dorsal fin commences before the front margin of the upper eye and behind that of the lower, and terminates at some distance from the caudal; its greatest height is in its hinder fourth.

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* Teeth in the jaws in a very narrow band, widening anteriorly.

Lateral line with a slight ("*liten*") curve above the pectoral, and composed of thirty-six pores in its straight portion. Scales rhombic, with an obtuse angle posteriorly, ciliated.

West coast of Norway.

3. Ventrals united with anal.

7. Rhombus punctatus.

Pennant, Brit. Zool. iii. tab. 41. no. 106 (erroneously named Smear-Dab).
Grosse Plie ou Targeur, *Duham. Pesch.* iii. sect. 9. pl. 5. fig. 4.
Pleuronectes punctatus, *Bl. Ausl. Fische,* iii. p. 31. tab. 189; *Bl. Schn.* p. 155.
—— kitt, *Bl. Schn.* p. 162.
—— hirtus, *Abildg. in Müll. Zool. Dan.* iii. p. 36, tab. 103; *Fries in Wiegm. Arch.* 1840, p. 32; *Jen. Man.* p. 463.
Zeugopterus hirtus, *Gottsche in Wiegm. Arch.* 1835, p. 178.
Rhombus hirtus, *Yarr. Brit. Fish.* 2nd edit. ii. p. 334, or 3rd edit. i. p. 646; *Parn. Wern. Mem.* vii. p. 376, or *Fish. Frith of Forth,* p. 216; *Nilss. Skand. Faun. Fisk.* p. 646.

B. 7. D. 93–99. A. 70–80. Vert. 12/25. Cæc. pylor. 0.

Dorsal and anal fins lapped over posteriorly on the blind side of the tail, the last rays forming a small flap there. The height of the body is nearly one-half of the total length (without caudal), the length of the head one-third. Scales rudimentary, but each scale provided with some spines, so that the surface of the whole coloured side is very rough, the head and fin-rays being covered with similar scales. Lateral line rather indistinct, curved above the pectoral, the depth of the curve being somewhat more than that of the base of the pectoral. Jaws subequal anteriorly; the length of the maxillary is one-half of that of the head. Snout very obtuse, rather longer than the eye, the diameter of which is one-sixth of the length of the head. Eyes separated by a very narrow ridge, the lower being somewhat in advance of the upper. The dorsal fin commences, with the shortest rays on the foremost part of the snout, vertically at some distance before the lower eye, and is continued on to the root of the caudal; its longest rays occupy the fifth sixth of the fin, where they are nearly equal to the length of the pectoral, and two-fifths of that of the head. Gill-rakers closely set, elongate-lanceolate, the longest being two-thirds of the diameter of the eye. Brown, with round black spots; one behind the curve of the lateral line and another on its straight portion, two black spots above the upper eye, and an oblique black band from the lower eye to the suboperculum.

From the British Channel along the coasts of northern Europe.

a. Adult. North coast of Norway. Purchased of Mr. Brandt.
b–c. Fine specimens. Båhuslän. Presented by Hr. A. W. Malm.
d. Adult: stuffed. Dawlish.
e. Adult: skin. South Devonshire.
f–h. Adult and half-grown: skins. From Mr. Yarrell's Collection.
i. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.

k. Fine specimen.
l. Adult: skin.
m. Adult: skeleton: not good state. British.

The length of the first *hæmal* spine equals that of the ten anterior vertebræ.

6. PHRYNORHOMBUS.

Rhombus, sp., *Auct.*

Eyes on the left side. Mouth wide, the length of the maxillary being more than one-third of that of the head. Each jaw with a narrow band of villiform teeth, without canines; no vomerine or palatine teeth. The dorsal fin commences on the snout; nearly all the dorsal and anal rays are branched. Scales very small, spiny. Gill-membranes scarcely united at the throat; gill-rakers well developed, compressed. Branchiostegals five.

Coasts of Europe.

1. Phrynorhombus unimaculatus.

La petite Limandelle, *Duham. Pesch.* iii. sect. 9. p. 270. pl. 6. fig. 5.
Pleuronectes punctatus, (not *Bl.*) *Flem. Wern. Mem.* ii. p. 241; *Phil. Zool.* tab. 3. fig. 2; *Brit. An.* p. 196; *Jen. Man.* p. 462.
Rhombus punctatus, *Yarr. Brit. Fish.* ed. 2. ii. p. 338, ed. 3. i. p. 650.
—— unimaculatus, *Risso, Eur. Mérid.* iii. p. 252. fig. 35 (bad); *Bonap. Faun. Ital. Pesc.*; *Nilss. Skand. Faun. Fisk.* p. 645.
—— uniocellatus, *Nardo, Prodr. Ichth. Adriat.* no. 135.

B. 5. D. 78–79. A. 67.

Dorsal and anal fins turned over posteriorly on the blind side of the tail, where the last rays form a small flap. Ventrals disconnected from the anal. The height of the body is nearly one-half of the total length (without caudal), the length of the head two-sevenths. Scales small, but very distinct, each with about four spines at its posterior margin; head and fin-rays entirely covered with minute rough scales. The lateral line makes a subsemicircular curve above the pectoral. The lower jaw is slightly prominent; the length of the maxillary is one-half, or rather more than one-half, of that of the head. Snout obtuse, longer than the eye, the diameter of which is one-sixth of the length of the head. Eyes separated by a very narrow and elevated ridge, the lower being a little in advance of the upper, and sometimes provided with a slender tentacle. The dorsal fin commences a little before the vertical from the front margin of the lower eye, and is continued on to the root of the caudal. The first ray is produced into a filament, one-third as long as the head. The first dorsal ray is sometimes prolonged and filamentous. Gill-rakers rather widely set, half as long as the eye. Brownish-grey, with blackish spots: one at the end of the curve of the lateral line; a reddish ocellus edged with black on the middle of the tail.

From the Mediterranean to the coasts of Great Britain.

a. Fine specimen. Dalmatia.
b–e. Adult: skins. Plymouth and Weymouth.

7. ARNOGLOSSUS *

Rhombus, sp., *Cuvier.*
Arnoglossus, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.*

Mouth wide, or rather wide, the length of the maxillary being more, or not much less, than one-third of that of the head. Teeth minute, of equal size, in a single series in both jaws; vomerine and palatine teeth none. The dorsal fin commences on the snout; dorsal and anal rays simple. Scales of moderate size, deciduous; lateral line with a strong curve above the pectoral. Eyes on the left side. Gill-membranes broadly united below the throat; gill-rakers slender, styliform.

European seas. East Indian Archipelago.

1. Arnoglossus laterna.

The Scald-Fish.
Arnoglossus, *Rondel.* xi. c. 14. p. 324; *Aldrov.* ii. c. 43. p. 237; *Jonston,* i. tit. 1. c. 2. a. 2. punct. 1. p. 58; *Gesner, Aquat.* iv. p. 668; *Will.* p. 102. tab. F. 8. fig. 7.
Smooth Sole, *Penn. Brit. Zool.* iii. p. 204.
Pleuronectes laterna, *Walb. Art.* iii. p. 121.
—— casurus, *Penn. Brit. Zool.* 1812, iii. p. 325. pl. 53.
—— diaphanus, *Shaw, Zool.* iv. p. 309.
—— leotardi, *Risso, Ichth. Nice,* p. 318.
Rhombus nudus, *Risso, Eur. Mérid.* iii. p. 251; *Cuv. Règne Anim.*
Pleuronectes pellucidus, *Nardo, Ichth. Adriat.* no. 134.
—— arnoglossus, *Bl. Schn.* p. 157; *Flem. Brit. An.* p. 197; *Turt. Brit. Faun.* p. 97; *Bonap. Faun. Ital. Pesce*; *Jen. Man.* p. 465; *Canestr. Arch. Zool.* i. p. 14. tav. 1. fig. 4.
Rhombus arnoglossus, *Yarr. Brit. Fish.* 2nd edit. ii. p. 345, and 3rd edit. i. p. 644 (fig. bad).
Hippoglossus arnoglossus, *Costa, Faun. Nap.* ii. p. 32.

D. 90. A. 69. L. lat. 47.

Scales of moderate size, very thin and deciduous. The dorsal fin commences before the eye. Teeth minute, of equal size. The height of the body is contained twice and a half in the total length (without caudal), the length of the head thrice and three-fourths. The greatest depth between the anal fin and the straight portion of the lateral line is less than the length of the head. Snout with the jaws subequal anteriorly, as long as the diameter of the eye, which is two-ninths of the length of the head. The length of the maxillary is two-fifths, that of the mandible rather more than one-half of that of the head. Eyes separated by a very narrow, bony, prominent, naked ridge, the lower being slightly in advance of the other. Lateral line with a subsemicircular curve above the pectoral. The dorsal and anal are continued on to the root of the caudal; the longest dorsal rays are somewhat behind the middle of the fin, where they are half as long as the head, and rather shorter than the pectoral. The rays of the left ventral occupy the whole length between throat and vent, and a portion of the humeral arch projects behind the ventral in form of one or two triangular spines. Uniform transparent reddish.

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* 1. Rhombus pœcilurus, *Bleek. Amb. & Ceram,* p. 293.—Banka, Amboyna.

From the Mediterranean to the South coast of England and Ireland.

a, b. Adult: skins. Mediterranean.
c. Half-grown. Cannes. Presented by Th. Günther, M.D.
d. Half-grown: skin. Brixham.
e. Half-grown: skin. Plymouth. From Mr. Yarrell's Collection.
f–k. Half-grown: skins. British specimens.
l. Half-grown.

2. **Arnoglossus conspersus.**

Pleuronectes conspersus, *Canestr. Arch. Zool.* i. p. 10. tav. 1. fig. 2.

B. 7. D. 86–90. A. 67–70.

Scales of moderate size, very thin and deciduous; the dorsal fin commences before the eye. Teeth minute, of equal size. The height of the body is contained twice and a third in the total length (without caudal), the length of the head thrice and four-fifths. The length of the maxillary is nearly one-third, that of the mandible rather less than one-half of that of the head. Eyes separated by a very narrow scaly ridge, the lower being slightly in advance of the other. Lateral line with a subsemicircular curve above the pectoral. The dorsal and anal are continued on to the root of the caudal. A portion of the humeral arch projects behind the ventral in form of two triangular spines. The coloured side dotted with brown. (*Can.*)

Genoa.

3. **Arnoglossus boscii.**

Pleuronectes boscii, *Risso, Ichth. Nice,* p. 319. pl. 7. fig. 33; *Bonap. Faun. Ital. Pesce*; *Canestr. Arch. Zool.* i. p. 19. tav. 2. fig. 2.
Hippoglossus boscii, *Cuv. Règne Anim.*; *Risso, Eur. Mérid.* iii. p. 246.
Rhombus boscii, *Cuv. Règne Anim.* 2nd edit.

D. 75–82. A. 61–68. L. lat. ca 45.

Scales of moderate size. Teeth minute, of equal size. The dorsal commences before the eye. The height of the body is one-third of the total length (with the caudal), the length of the head one-fourth, that of the caudal one-sixth. The greatest depth between the anal fin and the straight portion of the lateral line is less than the length of the head. Interorbital space narrow, flattish, scaly; lateral line with a subsemicircular curve above the pectoral. Snout nearly as long as the eye, the diameter of which is one-third of the length of the head. Lower jaw prominent; maxillary half as long as the head. Front margins of the eyes nearly on the same level. The distance of the dorsal from the caudal is less than the depth of the free portion of the tail. The longest dorsal rays are on the middle of the fin, and somewhat shorter than the pectoral, which is half as long as the head and much longer than the ventral. Transparent reddish-grey, with a pair of round blackish spots posteriorly on the dorsal and anal fins.

Mediterranean.

4. Arnoglossus aspilus.

Rhombus aspilos, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 14, or *Natuurk. Tydschr. Nederl. Ind.* 1. p. 408.

B. 6. D. 80–82. A. 61–63. L. lat. 45.

The height of the body is contained twice and a third in the total length (without caudal), the length of the head nearly four times. The width of the interorbital space is less than one-half of the diameter of the eye, which is one-fourth of the length of the head; the lower eye is in advance of the upper. Snout with the lower jaw prominent. The length of the maxillary is two-fifths of that of the head. A portion of the humeral arch projects behind the ventral. The dorsal and anal fins are continued on to the root of the caudal. Uniform brownish-grey.

Java, Bali, Sumatra.

a. Three inches long. From Dr. P. v. Bleeker's Collection, as *Pseudorhombus aspilos.*

5. Arnoglossus grohmanni.

Pleuronectes grohmanni, *Bonap. Faun. Ital. Pesce*; *Canestr. Arch. Zool.* i. p. 12. tav. 1. fig. 3.

D. 80. A. 52. L. lat. ca 45. (*Bonap.*)
86–90. 60–67. (*Canestr.*)

The height of the body is two-fifths of the total length (without caudal). Scales deciduous. Lower jaw slightly prominent; the length of the maxillary is rather less than one-third of that of the head. Eyes very close together, the lower in advance of the upper. The second dorsal ray is elongate. Brownish, clouded with darker; fins with brown spots.

Mediterranean.

6. Arnoglossus lophotes.

D. 95. A. 77. L. lat. 60.

The height of the body is contained twice and two-thirds to twice and four-fifths in the total length (without caudal), the length of the head four times and a half to four times and three-fourths. Scales deciduous; anterior curve of the lateral line subsemicircular. Snout with the lower jaw slightly prominent, as long as the eye, the diameter of which is one-fifth of the length of the head. The length of the maxillary is a little less than one-third of that of the head. Eyes separated by a very narrow elevated ridge, the lower being in advance of the upper. The four anterior dorsal rays are elongate, nearly as long as the head. The dorsal fin commences in front of the upper eye and terminates close by the caudal. Caudal fin somewhat shorter than the head, rounded. The length of the pectoral is two-thirds of that of the head. Coloration uniform (in a dried state).

Europe.

a–c. Skins, from 8 to 10 inches long. From Mr. Yarrell's Collection.

Mr. Yarrell's Collection was entirely composed of specimens of British, and of a few Mediterranean species. The locality has been noted by him only in a small proportion of the specimens, and unfortunately no record has been preserved by him as to the history of the specimens of this species. Nearly all the Mediterranean specimens are prepared in a uniformly peculiar manner, different from that in which the British specimens in general and the three specimens of *A. lophotes* especially were preserved. It is not at all improbable that those three specimens really are British.

8. CITHARUS.

Hippoglossus, sp., *Cuvier*.
Citharus, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.*

Mouth wide, the length of the maxillary being nearly one-half of that of the head. Teeth in a double series in the upper jaw, of unequal size; vomerine teeth; none on the palatines. The dorsal fin commences on the snout; dorsal and anal rays simple (?). Scales of moderate size, deciduous; lateral line with a curve above the pectoral. Eyes on the left side.

Mediterranean.

1. Citharus linguatula.

Citharus, *Rondel.* xi. c. 5. p. 314; *Gesner, Aquat.* iv. p. 127; *Aldrov.* ii. c. 44. p. 240; *Jonston*, ii. lib. 1. tit. 1. c. 2. a. 2. p. 59. tab. 20. fig. 14.
Solea altera (Pola), *Bellon. De Aquat.* p. 148.
Linguatula, *Willughby*, p. 101; *Ray*, p. 33.
Pleuronectes, sp., *Artedi, Synon.* p. 31. no. 4; *Genera*, p. 17. no. 5.
Solea, sp. 6, *Klein, Pisc. Miss.* iv. p. 32.
Pleuronectes linguatula, *L. Syst.* i. p. 457; *Fries in Wiegm. Arch.* 1840, p. 30; *Bl. Schn.* p. 151.
—— macrolepidotus, *Delaroche in Ann. Mus.* xiii. p. 353; *Bonap. Faun. Ital. Pesce*; *Canestr. Arch. Zool.* i. p. 16. tav. 2. fig. 1!; (not *Bl.*).
—— solea var. pataracchia, *Naccari, Ichth. Adriat.* p. 11.
Hippoglossus macrolepidotus, *Cuv. Règne Anim.*
Pleuronectes citharus, *Spinola in Ann. Mus.* x. p. 166.
Hippoglossus citharus, *Risso, Eur. Mérid.* iii. p. 146; *Costa, Faun. Nap.* ii. p. 27.

D. 64–66. A. 46. L. lat. ca 36.

The height of the body is rather less than one-third of the total length (with the caudal), the length of the head one-fourth, that of the caudal nearly one-sixth. The greatest depth between the anal fin and the straight portion of the lateral line is much less than the length of the head. Scales deciduous, smooth, obscurely ciliated; interorbital ridge very narrow. Lateral line with a curve above the pectoral, the depth of the curve being equal to the width of the base of the pectoral. Snout rather longer than the eye, the diameter of which is one-fourth or one-fifth of the length of the head. Lower jaw prominent; maxillary nearly half as long as the head. Teeth conical, pointed, of unequal size. The upper eye is situated in advance of the lower. The longest dorsal rays are in and behind the middle of the fin, and only half as long as the pectoral; the last dorsal and anal rays extend to the base of the caudal, if laid backwards. Pectoral twice as long as ventral, its length being two-thirds of that of the head. Transparent reddish-grey.

Mediterranean.

9. BRACHYPLEURA.

Mouth wide, the length of the maxillary being one-half of that of the head. Teeth pointed, conical, curved: the anterior of the upper jaw enlarged, and disposed in two series; those of the lower jaw in a single series; vomerine teeth present. The dorsal fin commences on the snout; dorsal and anal rays simple. Scales of moderate size, deciduous. Eyes on the right side. Gill-membranes scarcely united at the throat; gill-rakers lanceolate.

New Zealand.

1. Brachypleura novæ zeelandiæ.

B. 6. D. 72. A. 48. L. lat. 30.

The height of the body is contained twice and a half in the total length (without caudal), the length of the head thrice and a quarter. Scales cycloid; lateral line without curve. Head nearly as high as long. Snout with the lower jaw very prominent, as long as the eye, the diameter of which is two-ninths of the length of the head. Cleft of the mouth curved, the convexity of the mandible fitting into the concavity of the upper jaw; the maxillary extends to behind the middle of the orbit. Tongue very slender, pointed; vomer very prominent. Eyes separated by a mere ridge, the upper in advance of the lower. There are two crescentic notches in the margin of the sub- and interoperculum. Gill-rakers rather widely set, slender, more than half as long as the eye. The third to eighth dorsal rays are very elongate, filiform in one (male?) specimen; in the other (female?) specimen those in the middle of the fin are the longest, two-fifths of the length of the head. The dorsal fin terminates close by the caudal; the anal fin commences between the extremities of the ventrals. The caudal fin is one-sixth of the total length; the length of the pectoral is three-quarters of that of the head. Coloration uniform, transparent.

New Zealand.

a. Forty-three lines long: male? From the Haslar Collection.
b. Forty-five lines long: female. New Zealand. Presented by Sir J. Richardson.

10. SAMARIS.

Samaris, *Gray, Zool. Misc.* p. 4.

Mouth equally developed on both sides, narrow, the length of the maxillary being one-third of that of the head. Eyes on the right side. Teeth in narrow bands, small, of equal size; no vomerine or palatine teeth. Fins prolonged. Dorsal and anal rays simple; the dorsal fin commences on the snout. Scales rather small, strongly ciliated; lateral line straight. Gill-membranes broadly united below the throat; gill-rakers rudimentary.

Chinese Seas.

1. Samaris cristatus.

Gray, l. c. p. 5.

D. 77. A. 52. L. lat. 75.

The thirteen anterior dorsal rays much elongate; pectoral, ventrals, and the posterior rays of the dorsal and anal fins long. Eyes very close together, circular. The height of the body is two-fifths of the total length (without caudal), the length of the head one-fifth.

Chinese Seas.

a. Six and a half inches long. China. Presented by General Hardwicke.—Type of the species.

b. Half-grown. China Seas. Presented by Vice-Admiral Sir E. Belcher, C.B.

c. Half-grown: stuffed. China.

11. PSETTICHTHYS.

Psettichthys, sp., *Girard in Proc. Acad. Nat. Sc. Philad.* 1854, p. 140.

Mouth of moderate width. Teeth slender. Eyes on the right side. Fins not prolonged; the dorsal fin commences before the eye, on the snout; dorsal and anal rays simple. Scales small; lateral line without curve.

West coast of North America.

1. Psettichthys melanostictus.

Girard in Proc. Acad. Nat. Sc. Philad. 1854, p. 140, and in *U. S. Pacif. R. R. Exped. Fishes*, p. 154.

D. 78. A. 60.

The height of the body is nearly one-third of the total length (with the caudal), the length of the head nearly one-fourth. Lower jaw the longer; the maxillary extends to below the anterior third of the orbit. Teeth very slender. Eyes on the right side, separated by a space of moderate width. Anterior dorsal rays higher than the following ones. Scales very small, cycloid. The lateral line descends in an oblique line to behind the pectoral. Grey, irregularly spotted with black. (*Girard.*)

West coast of North America.

12. CITHARICHTHYS.

Psettichthys, sp., *Girard in Proc. Acad. Nat. Sc. Philad.* 1854, p. 140.
Citharichthys, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.*

Mouth wide, the length of the maxillary being more than one-third of that of the head. Teeth in both jaws in a single series, of unequal size; vomerine and palatine teeth none. The dorsal fin commences on the snout; dorsal and anal rays simple. Scales of moderate size, ciliated; lateral line without curve. Eyes on the left side. Gill-membranes broadly united below the throat; gill-rakers lanceolate; branchiostegals five.

Tropical parts of the Atlantic. Coasts of California.

1. **Citharichthys spilopterus.**

D. 76–78. A. 60–63. L. lat. 47–50.

The height of the body is two-fifths of the total length (without caudal), the length of the head two-sevenths. Scales of the lateral line subquadrangular; lateral line nearly straight, gently descending anteriorly. Snout with the jaws equal in front, rather longer than the eye, the diameter of which is one-sixth of the length of the head. The maxillary, the length of which is contained twice and two-thirds in that of the head, extends beyond the middle of the orbit. Anterior teeth of the upper jaw widely set, much larger than the posterior, which are close together and very small; the lower jaw with seven or eight distant teeth of moderate size on each side. Eyes separated by a very narrow scaleless ridge, their front margins being nearly on the same level. Fin-rays scaly. The dorsal commences a little before the upper eye, and terminates close by the caudal; its longest rays are behind the middle, and one-half of the length of the head. Anal spine none. Caudal rounded; its length is one-sixth of the total. The pectoral is rather longer than half the length of the head; ventral much shorter, extending beyond the origin of the anal. Gill-rakers lanceolate, pointed, one-third as long as the eye. Greyish-olive (in spirits); a series of distant blackish spots along the basal portions of the anal and dorsal fins.

Atlantic coasts of tropical America; west coast of Africa.

a–b. Adult. Bahia. From Dr. O. Wucherer's Collection.
c. Adult. New Orleans. Purchased of Mr. Cuming.
d, *e–f*. Adult (7 inches long) and half-grown. St. Domingo. Purchased of Mr. Cuming.
g–o. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
p–q. Adult. Niger Expedition. From Mr. Fraser's Collection.
r–s, *t*, *u*, *v*. Adult and half-grown.

2. **Citharichthys sordidus.**

Psettichthys sordidus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1854, pp. 142 & 155, and in *U. S. Pacif. R. R. Exp. Fishes*, p. 155. pl. 40*b*.

D. 82. A. 72.

The height of the body is nearly one-third of the total length, the length of the head nearly one-fourth. Jaws equal anteriorly; the maxillary extends to below the pupil. Teeth slender, unequal. Eyes separated by a very narrow bony ridge. The dorsal rays increase in height towards the posterior third of the fin; the fin terminates close by the caudal. Scales not very small, ciliated; lateral line nearly straight. Yellowish; fins speckled with blackish. (*Girard.*)

Coasts of California.

13. HEMIRHOMBUS.

Rhombus, sp., *Cuv.*
Hemirhombus, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.*

Mouth wide, the length of the maxillary being more than one-third of that of the head. Teeth of the upper jaw in a double series, with canines anteriorly, those of the lower jaw in a single series; vomerine and palatine teeth none. The dorsal fin commences on the snout; dorsal and anal rays simple. Scales rather small, ciliated; lateral line without strong curve. Eyes on the left side. Gill-membranes broadly united below the throat; gill-rakers compressed, broadish.

Tropical parts of the Atlantic.

1. Hemirhombus aramaca.

Aramaca, *Marcgr.* p. 181.
? Pleuronectes macrolepidotus, *Bl.* vi. p. 25. tab. 190; *Bl. Schn.* p. 156; *Lacép.* iv. p. 656.
Pleuronectes aramaca, *Cuv. Règne Anim.*

D. 85. A. 65. L. lat. 70.

The dorsal commences before the eye. Teeth of the upper jaw in a double series, with one or two pairs of small canine teeth in front; those of the lower jaw closely set, conical, in a single series. Scales rather small, adherent, ciliated; lateral line nearly straight, each scale of the lateral line with one or two minute scales at the base. The height of the body is contained twice and a half in the total length, the length of the head thrice and three-fourths. Snout rather shorter than the eye, the diameter of which is two-ninths of the length of the head. Jaws equal in length anteriorly; the length of the maxillary is two-fifths of that of the head; maxillary scaly. Interorbital space concave, scaly, half as wide as the vertical diameter of the orbit; the concavity between the orbits is produced by two longitudinal ridges convergent posteriorly. Head nearly entirely covered with ciliated scales. Rays of the vertical fins scaly; the distance between dorsal and caudal is one-fourth of the depth of the free portion of the tail. The longest dorsal rays are behind the middle of the fin, two-fifths of the length of the head. The upper pectoral rays of the coloured side sometimes prolonged into a very long filament. Gill-rakers one-third as long as the eye, interiorly provided with spines. Brown, marbled with darker, and with numerous round light spots.

Atlantic coasts of tropical America.

a. Fine specimen. Cuba. From the Collection of the Zoological Society.

b–h. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.

i. Adult.

Hippoglossus ocellatus, Poey, Mem. Cub. ii. 1861, p. 314, appears to be very closely allied to Marcgrave's species; but its body is rather more elongate. Poey states—D. 89. A. 72. The fin-rays are said to be scaleless.

2. Hemirhombus guineensis.

Bleeker, in litt.

D. 86. A. 64. P. 11. L. lat. 52–56.

The height of the body is contained thrice in the total length, the length of the head four times and four-fifths; the width of the interorbital space is one-fourth of that of the orbit; cleft of the mouth curved; jaws subequal anteriorly, the maxillary extending to below the middle of the eye, its length being contained twice and two-fifths in that of the head. A pair of canine teeth anteriorly. The scales on the cheek are in eleven or twelve series. Scales cycloid. Greenish. (*Bl.*)

Coast of Guinea.

3. Hemirhombus (?) soleæformis.

Rhombus soleæformis, *Agass. in Spix, Pisc. Bras.* p. 86. tab. 47.

D. 88. A. 72.

Scales of moderate size, very thin, deciduous, provided with minute spines. The lateral line passes gradually and in an oblique direction into its straight portion. The height of the body is two-fifths of the total length (without caudal), the length of the head one-fourth. The lower jaw is rather the longer. The eyes are separated from each other by a scaly interspace, which is as wide as the orbit; nearly the whole of the lower eye is in advance of the upper. Dark-olive, with a large round black spot on the origin of the lateral line. (*Ag.*)

Atlantic.

Typical specimens in the Museum at Munich.

14. PSEUDORHOMBUS*

Pseudorhombus, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.* p. 5.

Mouth wide, the length of the maxillary being more than one-third of that of the head. Teeth in both jaws in a single series, of unequal size; vomerine and palatine teeth none. The dorsal fin commences on the snout; dorsal and anal rays simple. Scales small or rather small; lateral line with a strong curve anteriorly. Eyes on the left side; interorbital space not concave. Gill-membranes united below the throat, not attached to the isthmus; gill-rakers lanceolate.

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* 1. *Russell*, pl. 75.—Rhombus maculosus, *Cuv. Règne Anim.*—Coromandel.
2. Pleuronectes nauphala, *Ham. Buch. Gang. Fish.* p. 126.—Ganges.
3. Hippoglossus kingii, *Jenyns*, appears to be closely allied to the present genus. See p. 399.
4. Rhombus cocosensis, *Bleek. Kokos*, iii. p. 179.—We shall again mention this species at the end of *Rhomboidichthys* (p. 438).

From the eastern coasts of Africa to the Pacific coasts of Central and South America. New York. Brazil.

1. Pseudorhombus russellii.

Platessa russellii, *Gray, Ill. Ind. Zool.* pl. —. fig. 2 (too much elongate); *Cant. Catal. Mal. Fish.* p. 214.
Rhombus lentiginosus, *Richards. Ann. & Mag. Nat. Hist.* xi. 1843, p. 495; *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 15.
Platessa chrysoptera, *Richards. Ichth. Chin.* p. 278.
—— balteata, *Richards. l. c.*
? Rhombus polyspilos, *Bleek. Batav.* p. 503.
Rhombus oligodon, *Bleek. Verhand. Batav. Genootsch.* xxvi. *Nieuwe Nalez. &c.* p. 121; *Natuurk. Tydschr. Nederl. Ind.* vi. p. 419; *Act. Soc. Sc. Indo-Nederl.* v. *Japan,* v. tab. 3. fig. 2.

B. 7. D. 70–77. A. 56–60. L. lat. 75.

The dorsal commences in front of the eye. Extremity of maxillary scaly. The height of the body is one-half, or rather less than one-half, of the total length (without caudal), the length of the head two-sevenths. The greatest depth between the anal fin and the straight portion of the lateral line equals the length of the head. Scales ciliated, those on the cheek and on the anterior part of the body smaller than those on the tail, which are of moderate size; interorbital ridge very narrow and naked; no spines or tubercles along the lateral line or the base of the fins. Lateral line with a semicircular curve above the pectoral. Snout a little longer than the orbit, the diameter of which is one-fifth or one-sixth of the length of the head. Lower jaw prominent; the length of the maxillary is two-fifths of that of the head. Teeth conical, pointed: upper jaw with two or three pairs of stronger ones in front, and with a series of very small ones laterally; lower jaw with about five strong, widely-set teeth on each side. Front margins of the orbits nearly on the same level. Each fin-ray is accompanied by a series of small smooth scales, and the anterior rays of the dorsal and anal have their tips prolonged beyond the membrane; the distance of the dorsal from the caudal is only one-third of the depth of the free portion of the tail; the longest dorsal rays are in the posterior third of the fin, their length being two-fifths of that of the head; the pectoral is not quite twice as long as the ventral, and two-thirds as long as the head. Gill-rakers compressed, lanceolate, at moderate distance from one another, half as long as the orbit. Yellowish-brown; sometimes with two or three dark spots on the lateral line.

From the east coast of Africa to Australia.

a. Adult: skin. Umbilo River (Port Natal), within five miles of the mouth.

b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—Type of *Platessa russellii.*

c. Young. China. Presented by J. R. Reeves, Esq.

d. Adult: skin. China. Purchased of Mr. Warwick.

e. Adult. Borneo.

f. Half-grown. Ceram. From the Collection of Madame Ida Pfeiffer.

g, h. Fine specimens. Bengal. Presented by G. R. Waterhouse, Esq.

i–k. Half-grown: stuffed. East Indies.

l–m. Half-grown and young: skins. Pinang. From Dr. Cantor's Collection.

n. Half-grown. East Indian Archipelago. From Dr. P. v. Bleeker's Collection.

o. Adult: skin. Port Essington.

p. Half-grown: stuffed.

q–r. Young.

2. Pseudorhombus dentatus.

Pleuronectes dentatus, *L. Syst. Nat.* i. p. 458; *Bl. Schn.* p. 156.

? Platessa orbignyana, *Valenc. in D'Orbigny, Voy. Amér. Mérid. Poiss.* pl. 16. fig. 1; *Jenyns, Zool. Beagle, Fish.* p. 137.

D. 80–85. A. 64–69. L. lat. 105.

The dorsal commences in front of the eye. The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head four times or four times and a half. The greatest depth between the lateral line and the anal fin is less than the length of the head. Scales minutely ciliated, those on the head smaller than those on the body; interorbital space flattish, scaly, its width being equal to, or rather less than, the vertical diameter of the orbit; no spines or tubercles along the lateral line or the base of the fins. Lateral line with a strong curve above the pectoral, the depth of the curve being one-third of its width Snout longer than the orbit, the diameter of which is one-sixth or one-seventh of the length of the head. Lower jaw prominent; the length of the maxillary is contained twice and a third in the length of the head. Teeth conical, pointed: upper jaw with eight strong ones on its anterior half, and with a series of small ones on its posterior; the lower with seven or ten strong, widely-set teeth on each side. The lower eye is slightly in advance of the upper. Each fin-ray is accompanied by a series of small smooth scales; the distance between dorsal and caudal is one-half of the depth of the free portion of the tail; the longest dorsal rays are behind the middle of the fin, their length being one-third or two-fifths of that of the head, and equal to that of the pectoral. No spine before the anal. Uniform brown.

Atlantic coasts of America.

a. Twenty-six inches long: stuffed. From the Collection of the Zoological Society.—Probably brought by Capt. King from Port Famine.

The typical specimen, received by Linnæus from Dr. Garden, and named by himself *Pl. dentatus,* is still in the possession of the Linnean

Society of London. A second specimen, also from Dr. Garden, is perfectly identical with the former; but Linnæus, who apparently had received it at a different period, considered this as belonging to the species figured by Catesby, tab. 27, which he had named *Pl. lunatus* in the tenth edition of his 'Systema Naturæ.'

3. **Pseudorhombus oblongus.**

Pleuronectes oblongus, *Mitch. in Trans. Lit. & Phil. Soc. New York*, i. p. 391.

Platessa oblonga, *Dekay, New York Fauna, Fish.* p. 299. pl. 48. fig. 156.

D. 88. A. 66.

Eight to ten sharp, stout teeth on each side of the lower jaw; six to eight similar teeth on each side of the upper jaw, and the remaining posterior portion of the jaw filled up with numerous minute teeth. The height of the body is contained twice and a third in the total length (without caudal), the length of the head four times. Scales deeply imbedded in the skin; *interorbital space flat, scaly, broad, as wide as the snout is long.* Lateral line with a subsemicircular curve above the pectoral. Eyes rather small. The dorsal fin commences anteriorly to the upper eye, and its distance from the caudal is less than the depth of the free portion of the tail. Nearly uniform brownish; sometimes with spots. (*Dekay.*)

New York.

According to the figure quoted, this species seems to differ from *Ps. dentatus* in having a remarkably broad interorbital space.

4. **Pseudorhombus californicus.**

Hippoglossus californicus, *Ayres in Proc. Calif. Acad.* 1859, p. 29, and 1860, fig. 10.

D. 70. A. 55.

Teeth slender, sharp, curved, about thirty in the upper jaw and forty-six in the lower. The height of the body is one-third of the total length (without caudal), the length of the head one-fifth. The greatest depth between the anal fin and the straight portion of the lateral line is much less than the length of the head. The distance of the upper eye from the snout is equal to one-fourth of the length of the head, and the width of the interorbital space is one-sixth of the same length. The lateral line makes a strong curve above the pectoral. The length of the maxillary is nearly one-half of that of the head. The dorsal commences a little anteriorly to the upper eye, with its greatest height (which is one-third of the length of the head) at about the middle of its length; its distance from the caudal equals the depth of the free portion of the tail. Greyish-brown. (*Ayres.*)

Bay of San Francisco.

5. **Pseudorhombus arsius.**

Pleuronectes arsius, *Ham. Buch. Gang. Fish.* p. 128.

D. 81. A. 55.

The height of the body is one-half of the total length (without caudal). Greenish, with several brown cloud-like spots; two black ocelli edged with white on the straight portion of the lateral line.

Ganges.

A coloured drawing of this fish, 31 lines long, is in the Collection of Drawings presented by General Hardwicke to the British Museum.

6. **Pseudorhombus cinnamomeus.**

Rhombus cinnamomeus, *Schleg. Faun. Japon. Poiss.* p. 180. tab. 93; *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Japan*, p. 25.

D. 81–85. A. 64–65. L. lat. 80.

The dorsal fin commences in front of the eye. The height of the body is contained twice and two-fifths in the total length (with the caudal), the length of the head five times. Eyes very close together. Scales ciliated. Lateral line with a strong curve anteriorly. The length of the maxillary is nearly two-fifths of that of the head; lower jaw with about fifteen teeth on the left side, and with about thirty-five on the right. The left pectoral fin is longer than the right, which is half as long as the head. Yellowish, clouded with darker, and with numerous small bluish-white spots; a large brown spot on the lateral line, immediately behind the extremity of the pectoral.

Nagasaki.

7. **Pseudorhombus javanicus.**

Rhombus javanicus, *Bleek. Batav.* p. 502.

D. 69–74. A. 51–56. L. lat. 75.

The height of the body is contained twice and three-fourths to twice and one-fourth in the total length (without caudal), the length of the head four times; eyes very close together, the lower scarcely in advance of the upper. The length of the maxillary is two-fifths of that of the head. Canine or canine-like teeth none: in the upper jaw the anterior teeth are of moderate size, the posterior very small and numerous; the lower jaw with sixteen to twenty teeth on each side. Lateral line with a strong curve anteriorly. The dorsal fin commences before the upper eye. The length of the pectoral is contained once and a third in that of the head, that of the caudal six times in the total. Yellowish-olive, with scattered green dots and ocelli; dorsal and anal edged with yellow.

Java.

a. Half-grown. From Dr. P. v. Bleeker's Collection.

8. **Pseudorhombus multimaculatus.**

D. 71. A. 55. L. lat. 78.

The height of the body is contained once and three-fourths to once and four-fifths in the total length (without caudal), the length of the head thrice and a half to thrice and two-thirds. Scales ciliated. Eyes very close together, separated only by an elevated naked ridge. Snout with the jaws equal anteriorly, very short, as long as the eye, the diameter of which is one-fifth or one-sixth of the length of the head. The maxillary has its dilated portion scaly, and extends to behind the middle of the eye; its length is two-fifths of that of the head. The upper jaw has three pairs of stronger teeth in front, and a series of small ones laterally; the lower has about fifteen teeth on each side. The dorsal fin terminates at a short distance from the caudal; its anterior rays are shorter than those of the posterior fourth of the fin, which are the longest, being contained twice and a third in the length of the head. Caudal fin rather prolonged, rounded, its length being contained five times and a half in the total. Pectoral two-thirds of the length of the head. The ventral extends beyond the origin of the anal. Gill-rakers lanceolate, disposed at moderate distances, half as long as the eye. Greyish-brown, with smaller and larger subocellated blackish-brown spots; fins finely spotted with brown; a series of larger distant spots along the basal half of the dorsal and anal fins.

Hab. —— ?

a–c. From 8 to 9 inches long. From the Haslar Collection.

9. **Pseudorhombus triocellatus.**

Russell, i. p. 59. pl. 76.
Pleuronectes triocellatus, *Bl. Schn.* p. 145.
Rhombus triocellatus, *Cuv. Règne Anim.*; *Bleek. Sumatra*, iii. p. 528.

D. 69. A. 51. L. lat. 65.

The height of the body is contained once and three-quarters in the total length (without caudal). Scales ciliated; interorbital space naked, very narrow. Snout with the jaws subequal anteriorly, as long as the eye, the diameter of which is two-ninths of the length of the head. The length of the maxillary is contained twice and a third in that of the head. Teeth minute, of equal size, in a single series. Front margins of the orbits nearly on the same level. Fin-rays scaly: the dorsal fin terminates close by the caudal; its anterior rays are the longest, more than half as long as the head, and equal in length to the pectoral. Gill-rakers very slender, more than half as long as the eye, closely set. Brownish-olive: tail with three dark-brown ocelli, edged with white, disposed in a triangle.

East Indian Seas.

a–b. Adult. From the Collection of the Zoological Society.

10. **Pseudorhombus pentophthalmus.**

D. 70. A. 54. L. lat. 75.

The height of the body is contained twice in the total length (without caudal), the length of the head thrice and a third. Scales ciliated; eyes separated by a mere ridge. Snout with the jaws equal anteriorly, rather longer than the eye, the diameter of which is nearly one-fifth of the length of the head. The maxillary extends to behind the middle of the eye, and its length is one-half of that of the head. Upper jaw with two pairs of small canine teeth anteriorly. Front margins of the orbits on the same level. Fin-rays scaly: the dorsal fin terminates close by the caudal; its anterior rays are considerably shorter than those behind the middle of the fin, which are two-fifths as long as the head. The length of the caudal is one-fifth, that of the pectoral one-sixth of the total. Gill-rakers slender, closely set, half as long as the eye. Yellowish (in spirits), with brown ocellated spots, and with five violet, white-edged ocelli, disposed thus : : .

China Seas.

a. Forty-four lines long. China. Presented by Vice-Admiral Sir E. Belcher, C.B.

11. Pseudorhombus olivaceus.

Hippoglossus olivaceus, *Schleg. Faun. Japon. Poiss.* p. 184. tab. 94.
Rhombus wolffii, *Bleek. Japan*, p. 421, and *Act. Soc. Sc. Indo-Nederl.* v. *Japan*, v. tab. 2. fig. 3.

B. 7. D. 76–85. A. 57–61. L. lat. 120.

The height of the body is contained twice and two-thirds in the total length (without caudal). Scales ciliated; interorbital space flat, scaly, its width being one-third of the vertical diameter of the eye. Snout with the jaws subequal anteriorly, rather longer than the eye, the diameter of which is one-sixth of the length of the head. The length of the maxillary is one-half of that of the head. Teeth large, conical, pointed: upper jaw with two or three canines on its anterior portion and with a series of small ones posteriorly; lower jaw with about seven widely-set teeth on each side, increasing in length towards the symphysis. Front margins of the orbits on the same level, the upper being situated on the upper profile of the head. The depth of the curve of the lateral line is one-half of its width. Fin-rays scaly; the distance of the dorsal from the caudal is one-half of the depth of the free portion of the tail; the longest dorsal rays are behind the middle of the fin, their length being two-fifths of that of the head, and equal to that of the pectoral. Gill-rakers slender, lanceolate, rather closely set, not much shorter than the orbit. Brownish, clouded with darker; vertical fins with brown dots; a small round black spot on the lateral line and another on the posterior part of the abdomen.

Japanese and Chinese Seas.

a. Seven inches long. Amoy. From Mr. Swinhoe's Collection.

12. Pseudorhombus vorax.

Rhombus aramaca, *Casteln. Anim. nouv. ou rares, Poiss.* p. 78. pl. 40. fig. 3; (not *Marcgr.* or *Cuv.*).

D. 71. A. 54. L. lat. 74.

The height of the body is contained twice and a third in the total length (without caudal), the length of the head thrice and three-fourths. Scales smooth, not ciliated; the lateral line makes a semicircular curve above the pectoral. Snout with the lower jaw prominent, considerably longer than the eye, the diameter of which is one-seventh of the length of the head; cleft of the mouth wide, the length of the maxillary being a little less than one-half of that of the head; the maxillary extends beyond the vertical from the posterior margin of the orbit, and has its extremity partly covered with scales. Upper jaw with three pairs of canine teeth anteriorly, and with a series of small ones laterally; lower jaw with seven or eight distant teeth on each side, the anterior pair being rather strong. Interorbital space flat, scaly posteriorly, as wide as the vertical diameter of the orbit. The lower eye is slightly in advance of the upper. Fin-rays scaly: the dorsal fin terminates at a distance from the caudal which is equal to one-third of the depth of the free portion of the tail; its longest rays are in the posterior third of the fin, their length being equal to that of the pectoral, and contained twice and a third in that of the head. Caudal fin rounded; its length is contained five times and a half in the total. Brownish-grey: body and vertical fins with large irregular blackish spots; caudal with some whitish spots besides; rays of the pectoral with black spots, the spots forming transverse bands. Gill-rakers widely set, lanceolate, not quite so long as the eye.

Atlantic coasts of tropical America.

a. Fine specimen. South America. Presented by Sir R. Schomburgk.
b. Fine specimen.
c–d. Adult. From the Haslar Collection.

13. Pseudorhombus ocellaris.

Platessa ocellaris, *Dekay, New York Fauna, Fishes,* p.300. pl.47.fig.152.

D. 95. A. 72.

Teeth in the lower jaw long, distant, acute, and about twenty-four in number; in the upper jaw, the four in front on each side long, those on the sides small, numerous and subequal. The height of the body is two-fifths of the total length (without caudal), the length of the head one-fourth. Bony ridge between the orbits narrow; eyes of moderate size. Lateral line with a semicircular curve above the pectoral. The dorsal commences anteriorly to the eyes, and its distance from the caudal is less than the depth of the free portion of the tail. Brownish, with six to ten black spots edged with white, and with numerous indistinct pale spots. (*Dekay.*)

New York.

14. Pseudorhombus (?) oligolepis.

Rhombus oligolepis, *Bleek. Japan,* v. p. 8. tab. 2. fig. 2.

D. 66. A. 48. L. lat. 38.

Teeth in the jaws conical, small, subequal, more than thirty on each side of the upper jaw, and about sixteen in the lower. The height of the body is two-fifths of the total length; eyes very close together, the upper being scarcely in advance of the lower. Lateral line with a strong curve anteriorly; scales ciliated. The pectoral is a little shorter than the head. Olive, with brownish and pearl-coloured spots. (*Bleek.*)

Nagasaki.

Described from a single specimen 64mm. long.

15. PARALICHTHYS.

Paralichthys, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 146.

Mouth large; slender and conical teeth on both sides of the jaws. The dorsal fin commences on the snout; dorsal and anal rays simple. Scales small, ciliated; lateral line with a curve anteriorly. Eyes on the right side.

California.

1. Paralichthys maculosus.

Pleuronectes maculosus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1854, p. 155.

Paralichthys maculosus, *Girard in U. S. Pacif. R. R. Exped. Fishes*, p. 147.

D. 68. A. 52.

Body elongate, subelliptical; the length of the head is contained four times and one-third in the total (with the caudal). The lower jaw is the longer; the maxillary extends behind the orbit. The ventral fin is small and reaches to the third anal ray. Reddish-brown, scattered all over with numerous spots of a darker hue. (*Girard.*)

San Diego.

16. RHOMBOIDICHTHYS *.

Rhombus, *Auct.*

Rhomboidichthys, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manad. & Makass.* p. 67.

Platophrys, *Bleek. Compt. Rend. Acad. Sc. Amsterd.* 1862, xiii. *Pleuron.* p. 5.

Mouth of moderate width, or small, the length of the maxillary being one-third, or less than one-third, of that of the head. Teeth minute, of equal size, in a single or double series; vomerine † and palatine teeth none. Eyes separated by a concave more or less broad space. The dorsal commences on the snout; dorsal and anal rays simple. Scales ciliated; lateral line with a strong curve anteriorly. Eyes on the left side.

Seas between the tropics; Mediterranean; Sea of Japan.

α. Scales very small: *Rhomboidichthys*, m., p. 432.

β. Scales of moderate size (L. lat. 40) and deciduous: *Platophrys*, p. 437.

γ. Scales of moderate size (L. lat. 52) and not deciduous: *Engyprosopon*, p. 438.

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* ? 1. Pleuronectes maculiferus, *Poey, Mem. Cub.* ii. 1861, p. 316.—Cuba.

† See *R. marchionessarum*, p. 435.

a. Scales very small.

1. Rhomboidichthys podas.

Rhomboides, *Rondel.* xi. c. 4. p. 313; *Gesner, Aquat.* iv. p. 663; *Aldrov.* ii. c. 45. p. 242; *Willughb.* p. 96. tab. F. 8. fig. 2; *Ray, Syn.* p. 32. no. 8.
Rhombus, sp. 4, *Klein, Pisc. Miss.* iv. p. 35.
Pleuronectes podas, *Delaroche, Ann. Mus.* xiii. p. 354. tab. 24. fig. 14.
—— argus, *Risso, Ichth. Nice*, p. 317.
Rhombus gesneri, *Risso, Eur. Mérid.* iii. p. 254.
—— podas, *Bonap. Faun. Ital. Pesc.*; *Costa, Faun. Nap.* ii. p. 22. tav. 43; *Canestr. Arch. Zool.* i. p. 21. tav. 2. fig. 3.
—— serratus, *Valenc. in Webb & Berth. Iles Canar. Poiss.* p. 82. pl. 18. f. 1.

D. 88. A. 70 *.

Scales very small, ciliated; a series of minute spines along the base of the dorsal and anal fins. The height of the body is contained once and four-fifths in the total length (without caudal); the length of the maxillary is nearly one-fourth of that of the head. The width of the interorbital space equals the diameter of the eye †. The lower eye is much in advance of the upper. The length of the caudal fin is one-sixth of the total. Brownish, with numerous rounded bluish spots; a black spot on the lateral line.

Mediterranean.

a. Adult: bad state. Mediterranean. Purchased of Mr. Frank.
b. Bleached. Sicily. Presented by W. Swainson, Esq., as *Rhombus swainsonii.*

2. Rhomboidichthys mancus.

? Pleuronectes mancus, *Brouss. Ichthyol.* c. duab. fig.
Pleuronectes mancus, *Risso, Ichth. Nice*, p. 317.
Rhombus mancus, *Risso, Eur. Mérid.* iii. p. 253.
—— madeirensis, *Lowe, Proc. Zool. Soc.* 1833, p. 143, and *Trans. Phil. Soc. Cambr.* vi. p. 201. tab. 6. fig. 1.
—— rhomboides, *Bonap. Faun. Ital. Pesce* (not *Rondel.*); *Costa, Faun. Nap.* ii. p. 19; *Canestr. Arch. Zool.* i. p. 24. tav. 3. fig. 2.
—— heterophthalmus, *Benn. Proc. Comm. Zool. Soc.* 1831, p. 147.

D. 85–91. A. 70.

Scales very small, ciliated; those along the base of the front part of the anal with a minute spine each. The height of the body is contained once and three-fourths in the total length (without caudal); the length of the maxillary is nearly one-fourth of that of the head. The width of the interorbital space is much more than that of the orbit, varying according to age, but always more than one-third of the length of the head ‡. The lower eye is much in advance

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* Exactly the same numbers are stated by Bonaparte.

† Total length of the specimen 41 lines, of the head 9½ lines; width of the interorbital space 2 lines.

‡ Total length.	Length of head.	Width of interorbital space.
42 lines.	9 lines.	3½ lines.
62 ,,	13 ,,	5½ ,,
69 ,,	15 ,,	8 ,,
74 ,,	16 ,,	8 ,,
86 ,,	20 ,,	8½ ,,

of the upper. Maxillary and orbital margin sometimes with a prominent knob. The longest dorsal rays are in the posterior third of the length of the fin, two-fifths of the length of the head. The length of the caudal is rather more than one-fifth of the total. Pectoral rays not elongate. Colour either nearly uniform dark-brown, or brown with numerous bluish or light-reddish-brown spots edged with darker, and with a dark-brown spot on the lateral line.

Mediterranean and the neighbouring parts of the Atlantic.

a. Adult. Cannes. Presented by Th. Günther, M.D.
b. Half-grown. Sicily. Presented by W. Swainson, Esq., as *Rhombus podas*.
c. Adult: bad state. Mediterranean. Purchased of Mr. Frank.
d, e, f. Adult: Madeira.
g. Adult. Lanzarote. Presented by the Rev. R. T. Lowe.

3. **Rhomboidichthys lunatus.**

Catesby, Carol. pl. 27.
Pleuronectes lunatus, *L. Syst. Nat.* i. p. 459; *Bl. Schn.* p. 154.
—— argus, *Bl.* tab. 48.
Rhombus argus, *Cuv. Règne Anim.*

D. 92. A. 73. L. lat. 90.

The height of the body is one-half of the total length (without caudal); the length of the maxillary is one-third of that of the head. Teeth in a single series. The width of the interorbital space is much more than that of the orbit, one-third of the length of the head in full-grown specimens, one-fourth in half-grown. The lower eye is much in advance of the upper. Maxillary and orbital margin sometimes with a prominent knob. Gill-rakers lanceolate, widely set, one-third as long as the eye. The upper margin of the dorsal fin is nearly even, the length of one of the longest rays being two-fifths of that of the head. Caudal one-seventh of the total length. The upper rays of the pectoral sometimes exceedingly elongate. Brown, with large, rounded, light spots, surrounded by a blue ring; two blackish blotches on the lateral line; fins and head with numerous small round blue spots.

West Indies.

a–b. Fine specimens, 14 inches long.
c. Adult. From the Haslar Collection.
d. Half-grown: skin. West Indies. Purchased of Mr. Scrivener.
e–g. Adult and half-grown: skins. Jamaica.

4. **Rhomboidichthys ocellatus.**

Rhombus ocellatus, *Agass. in Spix, Pisc. Bras.* p. 85. tab. 46 (ventral erroneously united with caudal); *Casteln. Anim. nouv. Poiss.* p. 78.
? Rhombus bahianus, *Casteln. l. c.* pl. 41. fig. 1.

D. 86. A. 65. L. lat. 85.

The height of the body is two-thirds of the total length (without caudal); the length of the maxillary nearly one-fourth of that of the head. The width of the interorbital space is one-half of the length of the head[*]. The lower eye is much in advance of the upper. Maxillary and orbital margin (sometimes) with a prominent knob. The dorsal rays occupying the middle half of the fin are the longest, two-fifths of the length of the head. The caudal fin is rather less than one-fifth of the total. The upper rays of the pectoral (sometimes) elongate. Olive, with bluish ocelli, and with brown rounded spots, two or three of the largest along the lateral line. Vertical fins with brown spots.

Atlantic coasts of tropical America.

a, *b*. Fine specimens. Bahia. From Dr. O. Wucherer's Collection.

5. **Rhomboidichthys ellipticus.**

Pleuronectes ellipticus, *Poey, Mem. Cub.* ii. 1861, p. 315.

D. 104. A. 71.

The height of the body is two-fifths of the total length (with the caudal). The width of the interorbital space equals the vertical diameter of the eye; the eye occupies the second quarter of the head; the maxillary does not extend to below the middle of the eye. Dorsal fin nearly as high anteriorly as posteriorly, its height being one-sixth of that of the body. Male with prominent knobs on the maxillary and orbital margin, and with the upper pectoral rays exceedingly elongate. Yellowish-brown, with yellowish rings edged with brown, and with round blue spots; a whitish spot dotted with black, and bordered with a broad blackish band posteriorly, on the second third of the body. Fins with some short brownish streaks. (*Poey.*)

Cuba.

6. **Rhomboidichthys leopardinus.**

D. 86. A. 67. L. lat. 80.

The height of the body is contained once and three-quarters in the total length (without caudal), the length of the head thrice and three-quarters. Head considerably higher than long, with the anterior profile concave above the snout. Snout shorter than the eye, the diameter of which is one-fourth of the length of the head; cleft of the mouth narrow, the maxillary extending to below the front margin of the orbit, and its length being one-fourth of that of the head. Interorbital space concave, scaly, only its anterior portion and the snout being naked; the width between the eyes equals their longitudinal diameter. The posterior half of the lower eye falls vertically below the upper. Teeth very small, in two series in the upper jaw. (Maxillary and orbits without prominent knobs.) Anterior dorsal rays considerably shorter than those on and behind

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[*]

Total length. lines.	Length of the head. lines.	Width of inter-orbital space. lines.
55	12	6

the middle of the fin, which are somewhat less than half the length of the head. The length of the caudal is rather more than one-sixth of the total. (Pectoral not elongate.) Brownish, with numerous ocellated spots; vertical fins dotted with brown and white.

Hab. —— ?

a. Female, 6 inches long: rather bleached. From the Haslar Collection.

7. Rhomboidichthys pavo.

?? Rhombus macropterus, *Gaim. Voy. Uran. Zool.* p. 236, *Poiss.* pl. 50 (miserable figure).
Rhombus pavo, *Bleek. Kokos,* iii. p. 177.

B. 5. D. 98–100. A. 78–79. L. lat. 90.

The height of the body is one-half of the total length (without caudal); cleft of the mouth of moderate width, the maxillary extending to the vertical from the second third of the eye; the length of the maxillary is one-third of that of the head. The greater portion of the interorbital space is scaly; it is concave, and its width is much more than the diameter of the orbit. The whole of the lower eye is situated before the upper. Teeth very small, in a single series. Anterior dorsal rays much shorter than the middle ones, which are two-fifths as long as the head. Caudal fin a little less than one-sixth of the total length. Gill-rakers lanceolate, rather short, half as long as the eye. Brownish-yellow, with numerous larger and smaller whitish ocelli edged with bluish; each ocellus generally with brown centre; three large brown spots along the lateral line; head and vertical fins with numerous small ocelli, similar to those on the body.

Male with small knobs on the maxillary and orbital edge, which are covered with skin, with cutaneous flaps on the eye, and with the pectoral much elongate.

China. Kokos Islands. New Hebrides.

a. Fine specimen, 9½ inches long, male. China. Presented by Sir J. Richardson.

b. Skin of a female, 11 inches long. Aneiteum. From Mr. Macgillivray's Collection.

8. Rhomboidichthys marchionessarum.

Passer Marchionessarum, *Valenc. in Voy. Vénus, Poiss.* p. 344. pl. 9.

D. 90. A. 70. L. lat. 100.

Vomerine teeth. The height of the body is two-fifths of the total length (without caudal); the anterior profile of the head is slightly concave. The whole of the inferior eye is in advance of the upper; the interorbital space is twice as wide as the eye. Anterior dorsal rays short. (Maxillary with a knob; the upper pectoral rays prolonged into filaments.) Uniform brown. (*Val.*)

Marquesas Islands.

9. Rhomboidichthys pantherinus.

Rhombus pantherinus, *Rüpp. Atl. Fische,* p. 121. tab. 31. fig. 1; *Bleek. Kokos,* iii. p. 178.
Rhombus parvimanus, *Benn. Proc. Comm. Zool. Soc.* i. p. 168.
—— sumatranus, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 14.

D. 92. A. 69. L. lat. 85.

The height of the body is more than one-half of the total length (without caudal); cleft of the mouth of moderate width, the maxillary extending beyond the front margin of the orbit; the length of the maxillary is scarcely less than one-third of that of the head. Interorbital space scaly, very concave, its width being equal to the vertical diameter of the orbit. The posterior half of the lower eye falls vertically below the upper. Teeth small, in two irregular series. Anterior dorsal rays as long as any of the middle rays, two-fifths as long as the head. Caudal fin one-sixth of the total length. In spirits brown with irregular darker spots, and with a black spot on the lateral line; during life brownish with chestnut-brown spots, and with bluish dots between the spots.

Male with bony knobs at the maxillary and on the edge of the orbit, with cutaneous flaps posteriorly on the eye, and with the pectoral much elongate.

From the eastern coasts of Africa to the Feejee Islands.

a. Adult female. Mauritius. From Mr. Gerrard's Collection.—Type of *Rh. parvimanus,* Benn. Pect. 12.
b. Half-grown. Madagascar. Presented by Dr. J. E. Gray.
c, d. Adult. Amboyna. Purchased of Mr. Frank.
e–f. Adult. Feejee Islands. Voyage of the 'Herald.'
g, h, i, k–l. Adult and half-grown: bad state.

10. Rhomboidichthys myriaster.

Rhombus myriaster, *Schleg. Faun. Japon. Poiss.* p. 181. pl. 92. fig. 2.
Rhomboidichthys myriaster, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Manad. & Makuss.* p. 67.

D. 88 (95). A. 65.

The height of the body is a little less than one-half of the total length (with the caudal); the length of the maxillary is less than one-third of the length of the head. Anterior profile of the head subvertical, convex. The width of the interorbital space is much more than that of the orbit. Teeth in the upper jaw two-rowed. The lower eye is in advance of the upper, and both are provided with a cutaneous lobe posteriorly; maxillary and orbits (sometimes) with osseous knobs anteriorly. Scales exceedingly small, smooth, entire, those along the base of the dorsal and anal ctenoid. Caudal one-sixth of the total length. The upper rays of the pectoral (*sometimes*) exceedingly elongate. Vent on the left side. Greenish-violet, entirely covered with small round blue and yellowish spots. A black spot on the lateral line.

Japan. Celebes.

a. Very young. China. Presented by Vice-Admiral Sir E. Belcher, C.B.
b. Adult: bad state. From Dr. P. v. Bleeker Collection.

11. **Rhomboidichthys assimilis.**

D. 87. A. 63. L. lat. 80.

The height of the body is rather more than one-half of the total length (with the caudal), the length of the head two-ninths; head much higher than long; anterior profile of the head oblique, somewhat concave. Cleft of the mouth narrow, with the lower jaw prominent, and with the maxillary extending to below the front margin of the orbit; snout shorter than the eye, the diameter of which is two-ninths of the length of the head. The maxillary is provided with a small knob superiorly, the edges of the orbits are smooth; length of the maxillary nearly one-fourth of that of the head. Teeth in the upper jaw in a double, those in the lower in a single series; interorbital space concave, scaly, its width being one-half of the length of the head. Gill-rakers very short, triangular. Vent on the left side. All the scales smooth; no spines along the base of the dorsal and anal fins. The longest dorsal rays, which are nearly half as long as the head, are behind the middle of the fin; the dorsal terminates close by the caudal. The length of the caudal fin is contained five times and two-thirds in the total. The upper pectoral rays are elongate. Uniform brown (in spirits).

Chinese Seas.

a. Six inches long. China. Presented by Sir J. Richardson.

β. Scales of moderate size and deciduous.

12. **Rhomboidichthys grandisquama.**

Rhombus grandisquana, *Schleg. Faun. Japon. Poiss.* p. 183. pl. 92. f. 3 & 4.

D. 76–83. A. 58–62. L. lat. 40.

The height of the body is a little less than one-half of the total length (without caudal). Scales deciduous; interorbital space scaly, concave, its width being equal to the diameter of the orbit in adult specimens, but narrower in immature ones. Mouth narrow, the length of the maxillary being equal to the diameter of the eye or to two-sevenths of the length of the head. Maxillary provided with a more or less pointed knob. Teeth in a single series. The dorsal terminates immediately before the root of the caudal. Gill-rakers very short, triangular. Uniform whitish (in spirits); caudal with a pair of black spots on the middle of its length, each spot being close to the upper and lower margins.

Chinese and Japanese Seas. N.W. coast of America.

a, b, c, d, e–g. Adult and half-grown. China.
h. Half-grown: bad state. Gulf of Fonseca. Presented by Sir J. Richardson.

γ. Scales of moderate size and not deciduous.

13. Rhomboidichthys mogkii.

Rhombus mogkii, *Bleek. Celebes,* v. p. 256.

D. 78–82. A. 58–62. L. lat. 52.

The height of the body is one-half of the total length (without caudal), the length of the head one-fourth. Scales of moderate size, ctenoid, not deciduous. Interorbital space scaly, narrow, concave (its width being one-third of that of the orbit in a specimen five inches long). Mouth of moderate width, the length of the maxillary being one-third of that of the head. No prominent knobs on the snout. Teeth of the upper jaw in a double series; all are very small, but some of the front teeth are slightly enlarged. The dorsal commences anteriorly on the snout, and terminates immediately before the root of the caudal. Gill-rakers slender, half as long as the eye. Brownish, minutely dotted with dark-brown.

Bali, Celebes, Ternate, and Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.

Although in this species the interorbital space is narrower than in its congeners, we do not hesitate to refer it to the present genus, with which it agrees in its dentition and in the *concavity* of the interorbital space.

Rhombus cocosensis, Bleek. Kokos, iii. p. 179, is known from a single specimen only; it is not evident from Bleeker's description whether this species ought to be referred to the present genus, and placed near to *Rh. mogkii,* or to *Pseudorhombus.*

17. PLEURONECTES *

Pleuronectes, sp., *Artedi.*
Platessa, *Cuv. Règne Anim.*
Platessa, Limanda, Microstomus, et Glyptocephalus, *Gottsche, in Wiegm. Arch.* 1835.
Platichthys, *Girard, in Proc. Acad. Nat. Sc. Philad.* 1856, p. 136.
Clidoderma, Pleuronectes, Limanda, Pseudopleuronectes, Brachyprosopon, et Glyptocephalus, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.*

Cleft of the mouth narrow, with the dentition much more developed on the blind side than on the coloured. Teeth in a single or double series, of moderate size; palatine and vomerine teeth none. The dorsal fin commences above the eye. Scales very small, or rudimentary, or entirely absent. Eyes generally on the right side.

Temperate and Arctic Seas of both the northern hemispheres.

If we were to attribute to some of the characters the same (generic) value as in other Pleuronectidæ, we should be obliged to establish a genus for almost every species, and to separate fishes which evidently form one natural group. Thus, for instance, the lateral line is strongly curved in *Pl. bilineatus*, and but slightly in the species nearest allied to it, viz. in *Pl. digrammus*. However, in order to show the limits assigned to the different subgeneric groups by their authors, we shall add the names to the several sections, so far as is consistent with the plan of division proposed by ourselves in the following synopsis:—

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* 1. Pleuronectes glacialis, *Pall. Itin.* iii. *App.* p. 706, and *Zoogr. Ross.-As.* iii. p. 424.—Mouth of the River Obi. (Dentition unknown.)

2. —— cicatricosus, *Pall. Zoogr. Ross.-As.* iii. p. 424.—Kamtschatka. (Dentition insufficiently described.)

I. Teeth compressed, truncate or lanceolate.

A. Dorsal rays less than 90.

a. Lateral line simple, straight or with a slight curve anteriorly.

* Scales minute: *Platessa*, part., Gottsche; *Pleuronectes*, part., Blkr., p. 440.

1. Pl. platessa.
2. Pl. pseudoflesus.
3. Pl. latus.
4. Pl. franklinii.
5. Pl. dvinensis.

* Scales imbricate: *Pseudopleuronectes*, Blkr., p. 443.

6. Pl. americanus.

* Scales none, skin with numerous tubercles: *Platichthys*, part., Girard, p. 443.

7. Pl. stellatus.

b. Lateral line with a dorsal branch: *Pleuronichthys*, part., Girard, p. 444.

8. Pl. bilineatus.
9. Pl. digrammus.
10. Pl. guttulatus.

c. Lateral line simple, with a strong curve above the pectoral: *Limanda*, Gottsche, p. 446.

11. Pl. limanda.
12. Pl. ferrugineus.

B. Dorsal rays 90 or more.

a. A prominent spine before the anal fin: *Microstomus*, Gottsche; *Brachyprosopon*, Blkr., p. 447.

13. Pl. microcephalus.

b. No prominent spine before the anal fin: *Glyptocephalus*, Gottsche, p. 449.

14. Pl. cynoglossus.
15. Pl. elongatus.

II. Teeth conical.

A. Lateral line with a very slight curve anteriorly.

a. Scales very small: *Platessa*, part., Gottsche; *Pleuronectes*, part., Blkr., p. 450.

16. Pl. flesus.
17. Pl. luscus.
18. Pl. italicus.

b. Scales none, skin with numerous tubercles: *Clidoderma*, Blkr., p. 453.

19. Pl. asperrimus.

B. Lateral line with a strong curve anteriorly: *Platichthys*, part., Girard, p. 453.

20. Pl. variegatus.
21. Pl. umbrosus.
22. 1 . asper.

I. Teeth compressed, truncate or lanceolate.

1. Pleuronectes platessa.

The Plaice.
Passer vulgaris, *Bellon. De Aquat.* i. p. 142.
Passer, pt., *Rondel.* xi. cap. 7. p. 316; *Gesner*, pp. 664, 670; *Schonev.* p. 61; *Willughby*, p. 96. tab. F. 3; *Ray*, p. 31.
Quadratulus, *Bellon. l. c.* p. 143.
Alia passeris species, *Rondel.* xi. c. 8. p. 318.
Passer lævis, *Aldrov.* ii. c. 47. p. 243; *Jonston*, i. tit. 3. c. 3. art. 2. punct. 1. tab. 22.
Pleuronectes, sp., *Artedi, Gen.* p. 17. no. 1; *Spec.* p. 57. no. 1; *Synon.* p. 30. no. 1; *Gronov. Zoophyl.* no. 246.
Pleuronectes platessa, *L. Syst. Nat.* i. p. 456; *Bl. Fische Deutschl.* ii. p. 31. taf. 42; *Bl. Schn.* p. 144; *Lacép.* iv. p. 628; *Donov. Brit. Fish.* i. pl. 6; *Turt. Brit. Faun.* p. 96; *Quensel, Vet. Akad. Handl.* 1806, p. 211; *Pall. Zoogr. Ross.-As.* iii. p. 423; *Faber, Fische Isl.* p. 135, and *Isis*, 1828, p. 865; *Nilss. Skand. Faun.* iv. p. 612; *Gronov. Syst. ed. Gray*, p. 87.
Passer, sp., *Klein, Pisc. Miss.* iv. p. 34. no. 6. tab. 7. fig. 3.
Plaise, *Penn. Brit. Zool.* iii. p. 199, and ed. 1812, iii. p. 304.
Carrelet ou Carreau, *Duham. Pêches*, ix. p. 264. pl. 5. figs. 1, 2.
Pli, *Duham. l. c.* p. 265. pl. 5. fig. 3.
Platessa vulgaris, *Gottsche, Wiegm. Arch.* 1835, p. 134; *Flem. Brit. An.* p. 198; *Jenyns, Man.* p. 454; *Yarr. Brit. Fish.* 2nd edit. ii. p. 297, or 3rd edit. i. p. 605; *Parn. Wern. Mem.* vii. p. 361. tab. 37, or *Fish. Frith of Forth*, p. 201. tab. 37.
Anatomy: *Gottsche, Wiegm. Arch.* 1835, p. 140.
? Variety: Pleuronectes borealis, *Faber, Isis*, 1828, p. 863; *Gottsche in Wiegm. Arch.* 1835, p. 142 *.

B. 7. D. 67–77. A. 50–57. Vert. 14/29. Cæc. pyl. 3–4.

The height of the body is one-half or less than one-half of the total length (without caudal), the length of the head two-sevenths. The greatest depth between the anal fin and the straight portion of the lateral line is less than the length of the head. Scales minute, smooth; cheeks with rudimentary scales; interorbital space naked. A series of six obtuse bony tubercles runs from the eye to the origin of the lateral line. Base of the fins and lateral line smooth; the latter is slightly curved above the pectoral, the depth of the curve being less than the width of the base of the pectoral. Snout nearly as long as the eye, the diameter of which is one-fifth or one-sixth of the length of the head. Lower jaw prominent; maxillary as long as the eye. Upper jaw with a series of about twenty-four narrow, closely-set incisor-like teeth on the blind side, those of the other side being small and few in number. Eyes separated by a very narrow smooth ridge; the lower eye scarcely in advance of the other. The dorsal commences above the middle of the eye and terminates at a short distance from the caudal, that distance being much less than the depth of the free portion of the tail. The length of the pectoral is contained twice and a third in that of the head. The dorsal rays about the thirty-eighth are the longest, more than half as long as the head. A spine before the anal. Gill-rakers styliform, rather short, widely set. Brownish or blackish, with yellow spots.

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* This variety is said to have 3' teeth on the blind side of the intermaxillary.

From the coasts of France along all the coasts of Northern Europe. Iceland.

a. Half-grown. Båhuslän. Presented by Hr. A. W. Malm.
b–g. Adult, half-grown, and young: skins and stuffed. Frith of Forth. From Dr. Parnell's Collection.
h–k. Very young. Frith of Forth.
l–n, *o*. Young. Brighton. Presented by Mr. E. Gerrard and by J. G. Children, Esq.
p. Large specimen. London market.
q–y. Adult, half-grown, and young: stuffed and skins. England.
z. Twenty-five inches long: stuffed.
α–β. Half-grown: skins. From Gronow's Collection.
γ–δ. Adult: skeletons. British.
ε. Adult: skeleton. German Ocean. From Dr. A. Günther's Collection.

Skeleton.—The bones of the jaws, the palatine and pterygoid are more developed on the left side than on the right; the hiatus between articulary and dentary is narrow. The two prefrontals with the turbinals are turned round towards the right side, being fixed to that portion of the principal frontal which separates the two orbits from each other; the occipital crest is very low. Pharyngeal bones very stout, bearing obtusely conical molar-like teeth, which are arranged in three or four irregular series. The urohyal is horseshoe-like; one of its branches is fixed by a tendinous filament to the hyoid, the other to the symphysis of the humeri. The pubic bones are very narrow, and attached to the humeral arch by a pair of long styliform processes. The structure of the vertebral column is very similar to that in *Rhombus*, but the number of interneurals and interhæmals is fewer, as frequently only one corresponds to a neural and hæmal spine. The length of the first hæmal spine equals that of the twelve first vertebræ; the anterior interhæmal is exceedingly strong, terminating in a polished spine anteriorly.

2. **Pleuronectes pseudoflesus.**

Platessa pseudoflesus, *Gottsche in Wiegm. Arch.* 1835, p. 143.

B. 7. D. 62–66. A. 46–48. Cæc. pyl. 4.

The height of the body is two-fifths of the total length (with the caudal), the length of the head two-ninths. Some scales along the lateral line, along the base of the dorsal and anal, on the sides of the head and of the abdomen are ciliated, the rest and the blind side being entirely smooth. A series of six obtuse bony tubercles runs from the eye to the origin of the lateral line. The latter is slightly curved above the pectoral, the depth of the curve being less than the width of the base of the pectoral. Eyes and snout as in *Pl. platessa*. The dorsal commences above the middle of the eye, and terminates at a short distance from the caudal; the rays about the thirtieth are the longest. A spine before the anal. Light-brownish, with yellow spots. (*Gottsche*.)

German Ocean.

3. Pleuronectes latus.

Cuvier, Règne Anim.

A series of six bony tubercles from the eye to the origin of the lateral line, as in *Pl. platessa,* but the height of the body is contained only once and a half in its length. (*Cuv.*)

Very rare on the coasts of France. Is not this species founded on deformed specimens of *Pl. platessa* ?

4. Pleuronectes franklinii.

Pleuronectes glacialis, *Richards. Faun. Bor.-Amer. Fish.* p. 258, and *Voy. Herald, Fishes,* p. 166. pl. 32 (not *Pall.*).

D. 56. A. 37. Vert. 13/27.

The height of the body is contained twice and a fourth in the total length (with the caudal), the length of the head four times and a third, that of the caudal fin six times. The greatest depth between the anal and the lateral line is a little more than the length of the head. Scales rudimentary and not imbricate on the head and on the anterior part of the body, very small on the tail; a broad rugose ridge between the upper eye and the lateral line; body entirely smooth on both sides; lateral line straight. Snout as long as the eye, the diameter of which is one-sixth of the length of the head. Lower jaw prominent, cleft of the mouth small, maxillary longer than the eye. Upper jaw with a single series of about twenty closely-set, short, incisor-like teeth on the blind side, the series of the other side being rudimentary. Eyes separated by a narrow smooth bony ridge, their front margins being on the same level. The dorsal commences immediately behind the front margin of the eye, and its distance from the caudal is less than the depth of the free portion of the tail. The dorsal rays about the thirty-second are the longest, equal in length to the pectoral and half as long as the head; ventral not much shorter than the pectoral; a spine before the anal. Gill-rakers widely set, pointed, half as long as the eye. Uniform brownish-grey.

Arctic seas of America.

a. Adult. Arctic Expedition. From Dr. Rae's Collection.
b. Adult. From the Haslar Collection.

5. Pleuronectes dvinensis.

Platessa dvinensis, *Lilljeb. Vet. Akad. Handl.* 1850, p. 360. tab. 20; *Nilss. Skand. Faun.* iv. p. 617.

D. 50–57. A. 36–41.

The height of the body is contained twice and two-thirds in the total length (with the caudal), the length of the head four times and one-third, the length of the caudal fin six times. Scales minute, scattered, with the posterior margin ciliated; spiny tubercles none; the blind side entirely smooth. Cleft of the mouth small, with the lower jaw prominent. Each jaw with a series of closely-set incisor-like teeth. Eyes separated by a prominent acute ridge, which is obtuse behind the eyes and continued on to the origin of the lateral line, where it terminates in two obtuse tubercles. Lateral line straight. A spine before the anal. Brownish; sometimes with brown spots on the dorsal and anal fins. (*Lilljeb.*)

Mouth of the river Dwina.

6. Pleuronectes americanus.

Pleuronectes, *Schoepf in Schrift. Gesellsch. Naturf. Freund. Berl.* viii. p. 148.
Pleuronectes americanus, *Walb. Art.* iii. p. 113.
—— planus, *Mitch. in Phil. & Lit. Trans. New York*, i. p. 387.
Platessa plana, *Storer, Fish. Massach.* p. 140; *Dekay, New York Faun. Fish.* p. 295. pl. 48. fig. 154, pl. 49. fig. 158.
—— pusilla, *Dekay, l. c.* p. 296. pl. 47. fig. 153.

D. 66. A. 51. L. lat. 90.

The height of the body is contained twice and a fourth or twice and a half in the total length (without caudal), the length of the head four times and a third. The greatest depth between the anal fin and the straight portion of the lateral line is equal to, or rather less than, the length of the head. Scales small, with the margins ciliated; nine series of scales between the eye and the præopercular limb; interorbital space flattish, covered with small, imbricate, ciliated scales. Lateral line and base of the vertical fins without tubercles; the former very slightly curved above the pectoral; most of the dorsal and anal rays with a series of minute rough scales. Snout as long as the eye, the diameter of which is one-sixth of the length of the head. Lower jaw prominent; maxillary somewhat longer than the eye. Upper jaw with a series of about twelve closely-set incisor-like teeth on the blind side. The width of the interorbital space is one-half of the vertical diameter of the eye; eyes on the same level. The dorsal fin commences before the middle of the eye, and its distance from the caudal is much less than the depth of the free portion of the tail. The length of the pectoral is more than one-half of that of the head. The dorsal rays about the forty-fourth are the longest, two-thirds of the length of the head. A spine before the anal. Gill-rakers short, triangular, compressed, widely set. Greyish-brown.

Atlantic coasts of the United States.

a–c. Adult: skins. New York. From Dr. Parnell's Collection.
d. Adult. New York. Purchased of Mr. Brandt.
e, f. Adult and half-grown.

7. Pleuronectes stellatus.

Pleuronectes stellatus, *Pall. Nov. Act. Petrop.* i. p. 347. tab. 9. fig. 1, and *Zoogr. Ross.-As.* iii. p. 416; *Tiles. Mém. Ac. Sc. St. Pétersb.* iii. 1811, p. 248. tab. 10; *Richards. Faun. Bor.-Amer. Fish.* p. 257, and *Voy. Herald, Fish.* p. 164. pl. 32.
Platichthys rugosus, *Girard in U. S. Pacif. R. R. Exped. Fish.* p. 148.

D. 54–59. A. 42. Vert. 12/23.

The height of the body is somewhat more than one-half of the total length (without caudal), the length of the head one-third. The greatest depth between the anal fin and the straight portion of the lateral line is a little less than the length of the head. Scales none; head, the coloured side and the anterior half of the blind side with numerous small, star-like, spiny tubercles; a series of these tubercles runs on each side of the base of the dorsal and anal fins and on each side of the lateral line. The lateral line is smooth, with a slight curve above the pectoral, the depth of the curve being much less than the width of the base of the pectoral. Snout as long as the eye, the diameter of which is one-fifth or one-sixth of the length of the head. Lower jaw prominent, lips moderately broad, maxillary longer than the eye. Upper jaw with a series of about twenty narrow, closely-set, truncated teeth on the blind side, those of the other side being smaller. Eyes generally on the left side, separated by a very narrow ridge, covered with star-like tubercles; the lower eye slightly in advance of the upper. A short prominence above the upper angle of the operculum. The dorsal commences above the middle of the eye, and terminates at some distance from the caudal, that distance being equal to the depth of the tail. The length of the pectoral is contained twice and a third in that of the head. The dorsal rays about the thirty-second are the longest, more than half as long as the head. A spine before the anal. Gill-rakers lanceolate, not half as long as the eye. Dark-brown; dorsal and anal with four, caudal with three black bands running in the direction of the rays.

Kamtschatka. Vancouver Islands. California.

a. Half-grown. Coronation Gulf, Behring's Straits. From the Haslar Collection.
b. Adult: skin. Esquimault Harbour. Presented by Earl Russell.
c–f. Young. Fraser's River. Voyage of H. M. S. Plumper.
g, *h*. Adult: not good state.

8. **Pleuronectes bilineatus.**

Platessa bilineata, *Ayres in Proc. Calif. Acad.* 1855, p. 40.

D. 77. A. 59.

The height of the body is a little less than one-half of the entire length, the length of the head nearly one-fourth. Snout somewhat projecting, not continuous in direction with the descending profile of the nape. Eyes on the right side, large, their diameter being two-sevenths of the length of the head, separated by a strong prominent ridge which is partly covered with scales. Lower jaw prominent. A single, even row of strong, blunt, conical (?) teeth in each jaw, less developed on the coloured side than on the blind. Scales very conspicuous, those on the head and on the tail ciliated. Lateral line with a strong curve above the pectoral: a second series of pores commences above the eye, and follows the dorsal profile to the vertical from the opercular angle, where it terminates; it communicates with the true lateral line by a branch. The dorsal fin arises over about the anterior third of the orbit, and terminates at a distance from the caudal equal to the breadth of the eye. Anal spine prominent. Pectoral half as long as the head. Light greyish-brown, with lighter blotches. (*Ayres.*)

San Francisco.

9. Pleuronectes digrammus.

D. 79. A. 60.

The height of the body is rather less than one-third of the entire length, the length of the head two-ninths, and that of the caudal two-thirteenths. Snout with the lower jaw prominent, equal in length to the diameter of the eye, which is nearly one-fifth of that of the head; maxillary as long as the eye. The upper jaw with a series of twenty-eight small truncated teeth on the blind side, those of the other side being few in number and very small. Eyes separated by a very narrow, naked, bony ridge. Scales small, but conspicuous; lateral line with a very slight curve above the pectoral; a second series of pores commences above the eye, and follows the dorsal profile to the twenty-sixth dorsal ray, where it terminates. Dorsal and anal rays quite smooth; the dorsal commences above the anterior third of the orbit, and terminates at a distance from the caudal nearly equal to the depth of the free portion of the tail. Anal spine prominent. The longest dorsal rays are somewhat behind the middle of the fin, rather shorter than the pectoral, and half as long as the head. Uniform brownish.

Vancouver Islands.

a–b. Eight inches long: skins. Victoria Harbour. Presented by Earl Russell.

10. Pleuronectes guttulatus.

Pleuronichthys guttulatus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1856, p. 137, and in *Journ. Bost. Soc. Nat. Hist.* 1857, pl. 25. figs. 1–4, and in *U. S. Pacif. R. R. Exped. Fishes,* p. 152.

D. 67. A. 47.

Teeth —— ?

The height of the body is somewhat more than one-half of the total length (with the caudal), the length of the head one-fourth, and that of the caudal one-fifth. The interorbital space is exceedingly narrow and raised, ridge-like; snout very blunt and short, mouth small, with the jaws even. The dorsal commences above the anterior part of the orbit, and terminates at a short distance from the caudal; its longest rays are on and behind the middle of the fin. Scales very small, cycloid. The lateral line is slightly arched above the pectoral; a similar series of pores runs from the upper eye, along the base of the dorsal fin, to about the middle of the length; there is a connecting branch between both lines across the occipital region. Greyish, densely dotted with black and spotted with white. (*Girard.*)

Tomales Bay, California.

11. Pleuronectes limanda.

The common Dab.
Passer asper, *Rondel.* xi. c. 9. p. 319; *Schonev.* p. 61; *Aldrov.* ii. c. 46. p. 242; *Willughby*, p. 97. tab. F. 4; *Ray, Syn.* p. 32.
Limanda, *Bellon. De Aquat.* p. 145; *Gesner*, pp. 665 & 781.
Pleuronectes, sp., *Artedi, Gen.* p. 17. no. 2; *Species*, p. 58. no. 11; *Synon.* p. 33. no. 9.
Sandflynder, *Ström, Söndm.* i. p. 278.
Pleuronectes limanda, *L. Syst. Nat.* i. p. 457; *Bl. Fische Deutschl.* ii. p. 45. tab. 46; *Bl. Schn.* p. 145; *Lacép.* iv. p. 621; *Quensel, Vet. Akad. Handl.* 1806, p. 220; *Faber in Isis*, 1828, p. 881; *Donov. Brit. Fish.* ii. p. 44; *Turton, Brit. Faun.* p. 96; *Fries och Ekstr. Skand. Fisk.* p. 150. pl. 34; *Nilss. Skand. Faun.* iv. p. 627.
Dab, *Pennant, Brit. Zool.* iii. p. 201, and edit. 1812, iii. p. 308.
La limande, *Duham. Pêches*, ix. c. 1. p. 267. pl. 6. figs. 1 & 2.
Pleuronectes platessoides, *Faber, Fische Isl.* p. 140 (not *Fabr.*).
Platessa limanda, *Flem. Brit. An.* p. 198; *Jenyns, Man.* p. 456; *Yarrell, Brit. Fish.* 2nd edit. ii. p. 307, or 3rd edit. i. p. 628; *Parn. Wern. Mem.* vii. p. 365. tab. 37, or *Fish. Frith of Forth*, p. 205. pl. 37.
Limanda vulgaris, *Gottsche in Wiegm. Arch.* 1835, p. 160.

B. 7. D. 70–76. A. 52–57. L. lat. 98. Vert. 39–40.
Cæc. pylor. 4.

The height of the body is nearly one-half of the total length (without caudal), the length of the head two-ninths. The greatest depth between the anal fin and the straight portion of the lateral line equals the length of the head. Scales small, with the margin ciliated; those on the cheek and between the eyes very distinct, smaller than those on the body. No tubercles along the lateral line or the base of the fins. Lateral line with a subsemicircular curve above the pectoral. Snout as long as the eye, the diameter of which is one-sixth of the length of the head. Lower jaw prominent; maxillary longer than the eye. Upper jaw with a series of about twenty-two narrow, closely-set lanceolate teeth on the blind side. Eyes separated by a narrow flattish ridge, their anterior margins being nearly on the same level. The dorsal fin commences a little before the middle of the eye, and its distance from the caudal is less than the depth of the free portion of the tail; each dorsal and anal ray is accompanied by a single series of very small scales; the thirty-ninth of the dorsal fin is the longest, two-thirds as long as the head. The length of the pectoral is more than one-half of that of the head. A spine before the anal. Brownish, sometimes with yellowish spots.

From the coasts of France along all the coasts of northern Europe. Iceland.

a. Adult: skin. Frith of Forth. From Dr. Parnell's Collection.
b. Adult: stuffed. Plymouth. Presented by Lieut. H. F. Spence, R.N.

The following specimens differ in having a more elongate body, and consequently in a somewhat lower curvature of the lateral line. The greatest depth of the body is only two-fifths of the total length (without caudal). This is *Pleuronectes* no. 249 of Gronow's Zoophylacium, or *Pl. linguatula*, Gronov. Syst. ed. Gray, p. 88; or *La*

Limandelle, Duham. ix. c. 1. p. 268. pl. 6. figs. 3 & 4*. Cuvier quotes the latter in the 'Règne Animal' for his *Pl. pola,* but says that the lateral line of this species is straight. It remains doubtful therefore whether *Pl. pola,* Cuv., is to be referred to *Pl. linguatula,* Gronov., or to *Pl. cynoglossus.*

a–b. Half-grown: skins. From Gronow's Collection.—Types of *Pl. linguatula.*

c. Adult: skin. From Mr. Yarrell's Collection.

Platessa rostrata, Storer, in Bost. Journ. Nat. Hist. vi. p. 268. pl. 8. fig. 2, appears to be allied to *Pl. limanda.*

12. Pleuronectes ferrugineus.

Platessa ferruginea, *Storer, Fish. Massach.* p. 141. pl. 2; *Dekay, New York Fauna, Fish.* p. 297. pl. 48. fig. 155.

D. 82. A. 61.

The height of the body is contained twice and a quarter in the total length (without caudal), the length of the head four times. The greatest depth between the anal fin and the straight portion of the lateral line equals the length of the head. Scales ciliated; lateral line with a strong curve above the pectoral, the depth of the curve being one-third of its length. Head scaly; there are about twelve vertical series of scales between the lower eye and the inner margin of the præoperculum. Snout as long as the eye, the diameter of which is somewhat less than one-fifth of the length of the head. Lower jaw prominent, lips broad, maxillary as long as the eye. Upper jaw with a series of about twenty-five small, closely-set teeth on the blind side, the teeth on the other side being rudimentary. Eyes separated by a very narrow ridge, the lower being slightly in advance of the upper. An indistinct ridge above the opercles, covered with minute tubercles. The dorsal commences above the anterior third of the eye, and terminates at a short distance from the caudal, that distance being two-thirds of the depth of the tail. The length of the pectoral is contained twice and two-thirds in that of the head. The dorsal rays about the forty-fifth are the longest, not quite half as long as the head. A spine before the anal. Gill-rakers lanceolate, half as long as the eye.

Atlantic coasts of the United States.

a. Adult. Boston. Presented by B. Winstone, Esq.

13. Pleuronectes microcephalus.

The Smear-Dab.

Rhombus lævis cornubicus, *Jago in Ray, Syn.* p. 162. fig. 1.

Smear-Dab, *Penn. Brit. Zool.* iii. p. 202 (not fig. 106).

Pleuronectes microcephalus, *Donov. Brit. Fish.* ii. pl. 42; *Turt. Brit. Faun.* p. 96; *Fries, Vet. Akad. Handl.* 1838, p. 173, or in *Wiegm. Arch.* 1840, p. 24; *Nilss. Skand. Faun.* iv. p. 609.

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* These figures are referred by several authors to *Pl. microcephalus,* but this has a much flatter curvature of the lateral line than Duhamel's Limandelle.

Pleuronectes quenselii, *Holb. Bohusl. Fisk. in Götheb. Vet. & Vitt. Sællsk. nya Handl.* iv. p. 59. c. fig.
—— quadridens, *Fabr. Kongl. Dansk. Vidensk. Selsk. Afhandl.* i. p. 39. tab. 1. figs. 10 & 11; *Faber, Fische Isl.* p. 138, and in *Isis*, 1828, p. 884.
—— microstomus, *Faber in Isis*, 1828, p. 886, and in *Tidskr. Naturvid.* v. p. 243; *Nilss. Prodr. Ichth. Scand.* p. 53.
Platessa microcephalus, *Flem. Brit. An.* p. 198; *Jen. Man.* p. 457; *Parn. Wern. Mem.* vii. p. 366. tab. 38, or *Fish. Frith of Forth,* p. 206. tab. 38; *Yarr. Brit. Fish.* ii. p. 221, 2nd edit. ii. p. 309, 3rd edit. i. p. 622.
Pleuronectes cynoglossus, *Nilss. Prodr. Ichth. Scand.* p. 53 (not *Skand. Faun.*).
Microstomus latidens, *Gottsche in Wiegm. Arch.* 1835, p. 150.

B. 7. D. 90. A. 73. L. lat. 130. Vert. 46–48 (13/35).
Cæc. pylor. 4.

The height of the body is contained twice and a fourth in the total length (without caudal), the length of the head five times and a half. The greatest depth between the anal fin and the straight portion of the lateral line is much more than the length of the head. Scales small, with the margins entire; head entirely covered with very small imbricate scales, snout and ridge between the eyes naked; body entirely smooth. Lateral line with a low curvature above the pectoral, the greatest depth of the curvature being less than the width of the base of the pectoral. Snout shorter than the eye, the diameter of which is one-fourth of the length of the head. Jaws equal anteriorly, lips very thick; maxillary rather shorter than the eye. Upper jaw with a series of about thirteen closely-set, truncated, incisor-like teeth on the blind side. Eyes separated by a sharp elevated ridge, their anterior margins being on the same level. The dorsal fin commences a little behind the anterior margin of the eye, and its distance from the caudal is rather less than one-half of the depth of the free portion of the tail. Dorsal and anal rays covered with minute scales; the dorsal rays about the sixtieth are the longest, two-thirds as long as the head, and equal in length to the pectoral. No prominent spine before the anal. Gill-rakers rather closely set, very thin, pointed and short. Brownish, sometimes marbled with darker.

Northern coasts of Europe. Iceland.

a–c. Adult: skin and stuffed. Frith of Forth. From Dr. Parnell's Collection.
d. Half-grown: stuffed. Scotland.
e–f. Adult and half-grown: skins. South Devonshire. From Mr. Yarrell's Collection.
g–h. Adult and half-grown: skins. Plymouth. From Mr. Yarrell's Collection.
i. Adult: stuffed. Polperro.
k. Adult. English coast. Presented by Dr. J. E. Gray.
l. Adult: stuffed. England.
m–q. Adult, half-grown, and young: skins and stuffed.
r. Adult: skeleton. British.

The four anterior *neural spines* are much broader than the following, as is the case in all the *Pleuronectidæ*; two interneurals and interhæmals always correspond to one neural and interhæmal with great regularity. The length of the first hæmal equals that of the twelve anterior vertebræ.

14. Pleuronectes cynoglossus.

The Craig-Fluke.

Pleuronectes, sp., *Gronov. Mus. Ichth.* i. p. 14. no. 39 (diagn. & synon. excl.), and ii. p. 11. no. 39; *Act. Helvet.* iv. p. 263. no. 145; *Zoophyl.* p. 74. no. 252.

Pleuronectes cynoglossus, *L. Syst. Nat.* i. p. 456; *Fries in Wiegm. Arch.* 1840, p. 19; *Nilss. Skand. Faun.* iv. p. 623; *Gronov. Syst. ed. Gray*, p. 88.

—— saxicola, *Faber in Isis*, 1828, p. 877.

—— nigromanus, *Nilss. Prodr. Ichth. Scand.* p. 55; *Cuv. Règne Anim. Ill. Poiss.* pl. 107 (bad).

Glyptocephalus saxicola, *Gottsche in Wiegm. Arch.* 1835, p. 156.

Platessa pola (? *Cuv. Règne Anim.*); *Jen. Man.* p. 458; *Parn. Wern. Mem.* vii. p. 370. tab. 38, or *Fish. Frith of Forth*, p. 210. tab. 38; *Yarr. Brit. Fish.* 2nd edit. ii. p. 315, 3rd edit. i. p. 616; *Thomps. Ann. Nat. Hist.* 1838, p. 16.

Craig-Fluke, *Parn. Edinb. New Phil. Journ.* 1835, p. 210.

B. 7. D. 102–117. A. 90–102. L. lat. 125. Vert. 58.
Cæc. pylor. 7.

The height of the body is contained twice and two-thirds to thrice and a half in the total length (without caudal), the length of the head five times and a half. Scales small, not ciliated; head entirely covered with very small imbricate scales, snout and ridge between the eyes naked; body entirely smooth. Lateral line straight, without curve. Snout rather shorter than the eye, the diameter of which is one-fourth of the length of the head. Jaws subequal anteriorly, maxillary shorter than the eye. Upper jaw with a series of about twenty closely-set, truncated, incisor-like teeth on the blind side. Eyes separated by a sharp ridge, elevated in front of the lower eye; the lower eye somewhat in advance of the other. The dorsal fin commences above the middle of the eye, and its distance from the caudal is rather less than one-half of the depth of the free portion of the tail. Bands of small scales along each dorsal and anal ray. The middle dorsal rays are the longest, a little more than half as long as the head; pectoral half as long as the head. No prominent spine before the anal. Greyish-brown; membranes of the fins with dark spots; pectoral of the coloured side black.

Northern coasts of Europe from the British Channel.

a. Adult: stuffed. Ireland. Presented by W. Thompson, Esq.
b. Half-grown: skin. Brixham. From Dr. Parnell's Collection.
c–e. Adult and half-grown: skins. Plymouth. From Mr. Yarrell's Collection.
f. Half-grown: skin. South Devonshire. From Mr. Yarrell's Collection.
g–l. Adult: skins. From Mr. Yarrell's Collection.

m–o. Adult: stuffed. Frith of Forth.
p. Adult: skin. From Gronow's Collection.—Type of the species.

Pleuronectes cynoglossus, Fabr. Faun. Grœnl. p. 163, or *Pl. pinguis*, Fabr. Vidensk. Selsk. Naturv & Math. Afhandl. i. p. 43. tab. 2. fig. 1, is probably identical with *Pl. cynoglossus*, Gronov. & Linn., as the only difference of any importance appears to be that the Greenland fish is said to have 72–74 rays in the anal fin. It is evident, however, from a single glance at the figure, that it is generically different from *Hippoglossus.*

15. Pleuronectes elongatus.

Platessa elongata, *Yarrell, Suppl. Brit. Fishes,* and *Brit. Fishes,* 2nd edit. ii. p. 318, and 3rd edit. i. p. 619.

D. 110. A. 96.

The height of the body is two-sevenths of the total length (without caudal), the length of the head nearly one-sixth. Scales of medium size, with numerous radiating striæ on the free portion. The lateral line makes a slight curve above the pectoral. Jaws subequal anteriorly, maxillary shorter than the eye; interorbital ridge prominent; the upper eye is somewhat in advance of the lower. The longest rays of the dorsal fin are on its middle, and its distance from the caudal is much less than the depth of the free portion of the tail. The pectoral is about half as long as the head, and twice as long as the ventral. Brownish. (*Yarr.*)

Bridgewater Bay.—The single (typical) specimen was 7¾ inches long; it was not in Mr. Yarrell's Collection when purchased by the British Museum.

II. Teeth conical.

16. Pleuronectes flesus.

The Flounder. Der Flunder, Bütt.

Passer fluviatilis, vulgo Flesus, *Bellon. De Aquat.* p. 144; *Will. Hist. Pisc.* p. 98. tab. F. 5; *Ray*, p. 32.

Passeris tertia species, *Rondel.* xi. c. 10. p. 319; *Gesner*, pp. 666, 782, 788.

Pleuronectes, *Artedi, Synon.* p. 31. no. 2; *Gen.* p. 17. no. 4; *Spec.* p. 59. no. 4; *Gronov. Zoophyl.* no. 248.

Pleuronectes flesus, *L. Syst. Nat.* i. p. 457; *Bl. Fische Deutschl.* p. 39. taf. 44; *Bl. Schn.* p. 146; *Lacép.* iv. p. 633; *Donov. Brit. Fishes,* iv. pl. 94; *Turt. Brit. Faun.* p. 96; *Faber, Fische Isl.* p. 144, and *Isis,* 1828, p. 873; *Ekstr. Fische Mörkö,* p. 247; *Pall. Zoogr. Ross.-As.* iii. p. 422; *Nilss. Skand. Faun.* iv. p. 618; *Gronov. Syst. ed. Gray,* p. 88.

Passer, sp., *Klein, Pisc. Miss.* iv. p. 33. no. 1. tab. 2. fig. 4, tab. 7. fig. 1.

Flounder, *Penn. Brit. Zool.* iii. p. 200, and edit. 1812, iii. p. 307.

Flet, *Duhamel,* ix. p. 273. pl. 7. fig. 2.

Platessa flesus, *Flem. Brit. An.* p. 198; *Jen. Man.* p. 455; *Gottsche in Wiegm. Arch.* 1835, p. 146; *Yarr. Brit. Fishes,* 2nd edit. ii. p. 303, or 3rd edit. i. p. 612; *Parn. Wern. Mem.* vii. p. 363. pl. 37.

Varieties.

Pleuronectes passer, *L. Syst. Nat.* i. p. 459; *Bl. Fische Deutschl.* p. 57. taf. 50.

Pleuronectes roseus, *Shaw, Nat. Misc.* vii. pl. 238, and *Zool.* iv. pl. 43.
Platessa flesus, var. marmorata, *Nordm. in Demid. Voy. Russ. Mérid. Pisc.* pl. 28. fig. 1 (in text Platessa luscus, var.).

D. 60–62. A. 39–45. Vert. $\frac{12}{23-24}$.

The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head thrice and one-third. The greatest depth between the anal fin and the straight portion of the lateral line is less than the length of the head. Scales minute, smooth, except those round the origin and along the anterior part, or sometimes along the whole of the lateral line; there are also bands of rough scales or of tubercles on the side of the head; cheek with rudimentary scales, interorbital space naked; an obtuse bony ridge from the upper eye to the lateral line. A series of rough tubercles along the base of the dorsal and anal fins. The lateral line is very slightly curved above the pectoral fin. Snout as long as the eye, the diameter of which is one-sixth of the length of the head. Lower jaw prominent, maxillary rather longer than the eye. Upper jaw with two series of small obtuse teeth; those of the outer series are about fifteen in number on the blind side. Eyes separated by a very narrow smooth ridge, their anterior margins being nearly on the same level. The dorsal commences before the middle of the eye; its distance from the caudal is more than the depth of the free portion of the tail. The length of the pectoral is one-half of that of the head. The dorsal rays about the thirty-seventh are the longest, nearly half as long as the head. Gill-rakers lanceolate, rather widely set, not quite half as long as the eye. Brownish or brownish-yellow, irregularly marbled.

From the coasts of France along all the coasts of northern Europe. Iceland.

a–b. Half-grown. Båhuslän. Presented by Hr. A. W. Malm.
c. Half-grown: skin. Frith of Forth. From Dr. Parnell's Collection.
d. Two adult specimens: stuffed. Frith of Forth. From Dr. Parnell's Collection.
e. Fine specimen, the blind side black-spotted. London market. Presented by Dr. A. Günther.
f–l. Adult, half-grown, and young: skins. Plymouth. From Mr. Yarrell's Collection.
m. Fine young specimen. Wales. Presented by Mrs. J. E. Gray.
n. Half-grown: stuffed. Cornwall.
o, p, q, r. Adult and half-grown.
s–w. Adult, half-grown, and young: stuffed and skins.
x–z. Half-grown: skeletons. British.
α. Skull of an adult male. German Ocean. From Dr. A. Günther's Collection.

The *skeleton* is very similar to that of *Pl. platessa*. The length of the first hæmal spine equals that of the nine anterior vertebræ.

17. Pleuronectes luscus.

Pleuronectes luscus, *Pall. Zoogr. Ross.-As.* iii. p. 427; *Rathke, Fauna der Krym,* p. 347; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 532, *Pisc.* tab. 27.
Platessa glabra, *Rathke, l. c.* p. 352.
—— luscus, *Kessler in Bull. Soc. Nat. Mosc.* 1859, part ii. p. 439.

D. 53-63. A. 39-43.

The height of the body is contained twice in the total length (without caudal), the length of the head thrice and a third. The greatest depth between the anal fin and the straight portion of the lateral line equals the length of the head. Scales minute, smooth; series of tubercles along the base of the dorsal and anal fins, and along the lateral line; there are also bands of rough scales or of tubercles on the side of the head; interorbital space naked. A granulated narrow ridge runs from between the eyes to the origin of the lateral line; the latter is very slightly curved above the pectoral. Lower jaw prominent, maxillary longer than the eye. The distance of the dorsal from the caudal is nearly equal to the depth of the free portion of the tail. The length of the pectoral is one-half of that of the head. The dorsal rays about the thirty-fourth are the longest, half as long as the head. Greenish, with scattered round brown spots on the body and fins; those on the body edged with white. (*Nordm.*)

Black Sea.

18. Pleuronectes italicus.

Passer, pt., *Rondel.* xi. c. 7. p. 316.
Pleuronectes flesus, var., *Delaroche, Ann. Mus.* xiii. 1809, p. 357.
Platessa passer, (not *L.*) *Bonap. Faun. Ital. Pesce*; *Costa, Faun. Nap.* ii. p. 7; *Canestr. Arch. Zool.* i. p. 8. tav. 1. fig. 1.

D. 62-64. A. 41-48.

The height of the body is contained twice and a fourth in the total length (without caudal), the length of the head thrice and a fourth. The greatest depth between the anal fin and the straight portion of the lateral line is less than the length of the head. Scales minute, smooth; lateral line smooth; interorbital space naked; an undulated osseous ridge runs from the upper eye to the lateral line, which is very slightly curved anteriorly. A series of small spines along the base of the dorsal and anal fins. Snout as long as the eye; lower jaw prominent, maxillary rather longer than the eye; teeth obtuse, subconical, small, about eighteen on the blind side of the upper jaw. Eyes separated by a very narrow smooth ridge. The distance of the dorsal from the caudal is equal to the depth of the free portion of the tail. The length of the pectoral is one-half of that of the head. The dorsal rays of the third quarter of the length of the fin are the longest, not half so long as the head. Greyish-brown, uniform or marbled with darker.

Mediterranean.

a. Fine specimen. Dalmatia. From Dr. J. Heckel.

19. Pleuronectes asperrimus.

Platessa asperrima, *Schleg. Faun. Japon. Poiss.* p. 177.
Clidoderma asperrimum, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.*

D. 75. A. 61.

The height of the body is rather less than two-fifths of the total length (without caudal), the length of the head two-ninths. The greatest depth between the anal fin and the straight portion of the lateral line is nearly equal to the length of the head. Scales none; head, body, and fin-rays densely covered with rough tubercles, some of which are much larger than the others, which are granule-like; some of the largest tubercles with a longitudinal keel. A series of these tubercles runs along the base of the dorsal and anal fins. Lateral line and the whole blind side smooth; the former makes a slight curve above the pectoral, the depth of the curve being much less than the width of the base of the pectoral. Snout as long as the eye, the diameter of which is one-fifth of the length of the head. Lower jaw prominent; each jaw with two series of slender conical teeth. The space between the orbits is granulated, and its width is one-third of the diameter of the eye. The dorsal fin commences above the anterior part of the eye, and its distance from the caudal is less than the depth of the free portion of the tail; the longest dorsal rays are behind the middle of the length of the fin, and shorter than the pectoral, the length of which is two-fifths of that of the head. Ventral very short, not half so long as the pectoral. Brownish. (*Schleg.*)

Japan.

20. Pleuronectes variegatus.

Platessa variegata, *Schleg. Faun. Japon. Poiss.* p. 176. pl. 90.

D. 79–81. A. 58–60.

The height of the body is contained twice and a third in the total length (without caudal), the length of the head four times and a half. The greatest depth between the anal fin and the straight portion of the lateral line is more than the length of the head. Scales ciliated; lateral line with a curve above the pectoral, the depth of the curve being equal to the width of the base of the pectoral. Head scaly, without ridge; interorbital space flattish, scaly, its width being one-third of the horizontal diameter of the eye, which equals the length of the snout. Lower jaw prominent, maxillary longer than the eye; upper jaw with two series of conical teeth. Vertical fins covered with minute scales; the dorsal commences above the front margin of the eye, and its distance from the caudal is much less than the depth of the free portion of the tail. The length of the pectoral equals that of the longest dorsal rays, which are somewhat behind the middle of the length of the dorsal fin, and one-half of the length of the head. Greenish, marbled with darker; vertical fins with round blackish spots. (*Schleg.*)

Japan.

21. Pleuronectes umbrosus.

Platichthys umbrosus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1856, p. 136, and in *U. S. Pacif. R. R. Exped. Fishes,* p. 149.

D. 70. A. 53. L. lat. 80.

The height of the body is two-fifths of the total length (without caudal), the length of the head two-sevenths. The greatest depth between the anal fin and the straight portion of the lateral line is somewhat less than the length of the head. Scales small, those on the middle of the side with the marginal portion covered with spines; head entirely covered with small, spiny, not imbricate scales; snout naked; the blind side smooth, no spines along the base of the dorsal and anal fins; lateral line smooth, with a strong curve above the pectoral, the depth of the curve being one-third of its width. Snout shorter than the eye, the diameter of which is two-ninths of the length of the head. Lower jaw prominent, maxillary as long as the eye. Upper jaw with a single series of about sixteen conical, closely-set teeth on the blind side, those of the other side being smaller and less in number. Eyes separated by a very narrow bridge, covered with small tubercles; the lower eye is scarcely in advance of the other. The dorsal commences immediately behind the anterior margin of the eye, and its distance from the caudal is one-half of the depth of the free portion of the tail. The dorsal rays about the fortieth are the longest, equal in length to the pectoral and half as long as the head. No spine before the anal. Uniform dark brown.

Pacific coasts of North America.

a–c. Adult and half-grown: skins. Esquimault Harbour, Vancouver Islands. Presented by Earl Russell.

22. Pleuronectes asper.

Pallas, Zoogr. Ross.-As. iii. p. 425.

D. 67. A. 48.

The height of the body is contained twice and four-fifths in the total length (with the caudal), the length of the head five times and a half. Each scale terminates in a small recurved spine; lateral line smooth, with a strong curve above the pectoral. The lower jaw is the longer; each jaw with a single series of obtuse distant teeth. Dorsal and anal rays provided with small spines. Brownish-olive. (*Pall.*)

Coasts of eastern Siberia.

18. PAROPHRYS.

Pleuronichthys, pt., et Parophrys, *Girard, Proc. Acad. Nat. Sc. Philad.* 1854, pp. 139, 140.

Heteroprosopon, *Bleek. Compt. Rend. Acad. Sc. Amsterd.* 1862, xiii. *Pleuron.* p. 8.

Cleft of the mouth narrow; teeth minute; scarcely any teeth on the coloured side; vomerine teeth none. The dorsal fin commences above the eye. Scales small or rudimentary; lateral line without strong curve. Eyes on the right side.

North Pacific.

1. Parophrys vetula.

Parophrys vetulus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1854, pp. 140, 142, 155, and in *U. S. Pacif. R. R. Exped. Fish.* p. 153.

D. 86. A. 64.

The teeth, which are minute, exist on the blind side of the fish only. The height of the body is one-third of the total length (with the caudal), the length of the head one-fourth. Snout with the lower jaw longest; cleft of the mouth small, the maxillary extending somewhat behind the anterior margin of the eye. Eyes separated by a very narrow and elevated ridge. Scales small, cycloid; lateral line but slightly curved above the pectoral. The dorsal fin commences above the upper eye and terminates at a short distance from the caudal; peduncle of tail slender. An anal spine. The length of the caudal is contained five times and a half in the total. Reddish-grey, marbled with darker. (*Girard.*)

Coast of California.

2. Parophrys cornuta.

Platessa cornuta, *Schleg. Faun. Japon. Poiss.* p. 179. pl. 92. fig. 1; *Bleek. in Verhand. Batav. Genootsch.* xxvi. *Japan*, p. 121.

Heteroprosopon cornutus, *Bleek. in Compt. Rend. Acad. Sc. Amsterd.* xiii. 1862, *Pleuron.* p. 8.

D. 80–82. A. 56–58.

The height of the body is one-half of the total length (without caudal), the length of the head two-elevenths. The greatest depth between the lateral line and the anal fin is much more than the length of the head. Scales very small, smooth; opercles scaly, without prominent osseous ridge. A longitudinal sharp ridge between the eyes, terminating in a spine posteriorly; the anterior margin of each orbit with two conical prominences, the upper prominence of the lower eye being the strongest. Lateral line nearly straight. Snout very short, only half as long as the eye, the diameter of which is one-fourth of the length of the head. Jaws equal anteriorly, provided with one or two series of minute pointed teeth; lips fleshy, maxillary shorter than the eye. The dorsal fin commences before the middle of the eye, and its distance from the caudal is somewhat more than the width of the orbit. Dorsal and anal rays covered with minute (in a fresh state scarcely visible) scales. The longest dorsal rays are immediately behind the middle of the fin, where they are two-thirds of the length of the head. Pectoral short, not much longer than ventral, two-fifths of the length of the head. Brownish, with several patches of numerous whitish dots; fins with numerous small round blackish spots. (*Schleg.*)

Japan.

3. Parophrys quadrituberculata.

Pleuronectes quadrituberculatus, *Pallas, Zoogr. Ross.-As.* iii. p. 423.

D. 70. A. 51.

Teeth ——?

The height of the body is contained twice and four-fifths in the total length (with the caudal). Head with a series of four bony, conical, obtuse, and very prominent tubercles, continuous with the lateral line: two of these tubercles are approximate and situated anteriorly, the third at the hinder margin of the upper orbit; the fourth is the largest, and situated above the opercle. Lateral line scarcely bent anteriorly. Body smooth, with the scales rudimentary. Anal distant from ventrals. Anal spine hidden. (*Pall.*)

Sea between Kamtschatka and America.

4. Parophrys cœnosa.

Pleuronichthys cœnosus, *Girard in Proc. Acad. Nat. Sc. Philad.* 1854, p. 139, and in *U. S. Pacif. R. R. Exped. Fish.* p. 151.

D. 74. A. 54.

The length of the head is two-elevenths of the total length, that of the caudal a little less than one-fourth. Snout very short; mouth small, the lower jaw longest. Teeth inconspicuous on both sides. Eyes separated by a narrow ridge, their diameter being one-third of the length of the head. The dorsal fin commences opposite the anterior margin of the orbit, is elevated towards its posterior third, and terminates at a short distance from the caudal. Scales small, entire and smooth; lateral line with a slight curve above the pectoral. Deep-brown, spotted with blackish and yellowish. (*Gir.*)

San Francisco.

5. Parophrys ayresii.

D. 66. A. 47.

The height of the body is rather more than one-half of the total length (with the caudal), the length of the head rather more than one-fifth, the length of the caudal less than one-fifth. Snout very short; mouth small, with the lower jaw longest, and with the maxillary extending beyond the front margin of the eye. Jaws with a broad band of villiform teeth on the blind side, and with a few on the coloured one. Eyes separated by a very narrow, elevated, smooth ridge; the lower eye slightly in advance of the upper; the diameter of the eye is one-fifth of the length of the head. Cheeks and opercles covered with minute scales. The dorsal fin commences somewhat before the middle of the eye, and is highest near the thirtieth ray, the length of which is rather more than one-half of that of the head. The distance between the dorsal and caudal is about one-third of the depth of the free portion of the tail. Anal spine prominent. The length of the pectoral equals the distance of the lower eye from the end of the operculum. Ventral about half as long as the pectoral, not united with the anal. Scales very small, imbricate, cycloid; the lateral line is very gently curved above the pectoral; a second lateral line runs from above the eye, along and near the dorsal profile, to behind the middle of the dorsal fin. Uniform brownish lead-coloured.

California.

a. Eight and a half inches long. San Francisco. Presented by Dr. W. O. Ayres.

We dedicate this species to the excellent Californian ichthyologist, whose discoveries only recently became accessible to us. The specimen, which appears to us specifically distinct from *P. cœnosa*, formed part of a splendid collection, which was nearly entirely destroyed during its transmission to Europe.

19. PSAMMODISCUS.

Eyes on the right side. Mouth rather narrow, the length of the maxillary being one-third or nearly one-third of that of the head; jaws more developed on the coloured side than on the blind. Teeth minute, in a single series or in an exceedingly narrow band; vomerine or palatine teeth none. The rays of the posterior half of the dorsal and anal fins are branched; the dorsal fin commences on the snout. Scales small; lateral line with a strong curve anteriorly. Gill-membranes broadly united at the throat; gill-rakers lanceolate. Branchiostegals six.

1. Psammodiscus ocellatus.

D. 64. A. 54. L. lat. 80.

The height of the body is contained once and two-thirds in the total length (without caudal), the length of the head thrice and a half. Head about as high as long. Scales cycloid. Snout very obtuse, as long as the eye, the diameter of which is somewhat less than one-fourth of the length of the head. Eyes separated by a very narrow ridge; their front margins nearly on the same level. Gill-rakers slender, one-third as long as the eye, closely set. The dorsal fin commences between the maxillaries and is continued on to the root of the caudal; its anterior rays have their tips prolonged beyond the membrane, the longest rays being in the posterior third of the fin, where they are one-half the length of the head. Anal spine present. Caudal fin rounded, one-fifth of the total length. Ventral fin very broad, a little shorter than the pectoral. Brownish-olive, finely marbled and spotted with brown; a deep-brown ocellus, edged with whitish, immediately below the middle of the straight portion of the lateral line; another similar but less distinct ocellus above the lateral line, behind the curve. Vertical fins irregularly spotted and dotted with brown and white.

Hab. —— ?

a–d. From 32 to 42 lines long.

20. AMMOTRETIS.

Eyes on the right side, on the same level, or the lower rather in advance. Mouth unsymmetrical, narrower on the right side than on the left, the length of the left maxillary being less than one-third of that of the head; teeth on the blind side only, where they are villiform, forming bands; no vomerine or palatine teeth. Dorsal and anal rays branched and scaly; the dorsal fin commences on the extremity of the snout and is not continued on to the caudal. Two ventrals, the right in the same line and continuous with the anal. Scales small, ctenoid; lateral line straight. Gill-openings narrow, the gill-membranes being broadly united below the throat; gill-rakers short, conical.

Tasmania.

1. Ammotretis rostratus.

B. 7. D. 80. A. 53. P. 12. V. dextr. 6, sin. 4. L. lat. 90.

The upper part of the snout is produced into a flap overhanging the lower jaw.

Norfolk Bay.

a. Four inches long. Presented by Sir J. Richardson.

Description.—The height of the body is nearly one-half of the total length (without caudal), the length of the head two-sevenths. Snout scarcely longer than the eye, the diameter of which is one-fifth of the length of the head; its upper part is produced and bent downwards into a flap which overlaps the lower jaw. The cleft of the mouth is strongly twisted towards the left side, and curved; on the right side it does not extend to the vertical from the orbit; nasal opening small, in front of the interorbital space. The lower eye is scarcely in advance of the upper; both are of moderate size, and separated by a scaly space, the width of which is one-half of the vertical diameter of the eye. The dorsal fin commences on the foremost part of the rostral appendage and terminates at a short distance from the caudal; its anterior rays are nearly entirely free, not connected by a membrane; its longest rays are behind the middle of the fin, their length being rather more than one-half of that of the head. Caudal rounded, shorter than the head; the rays of the right ventral occupy the whole space between chin and anal fin, whilst the base of the left ventral is much shorter. Scales on the right side with about ten small spines, those on the left with about six. Uniform brownish-olive.

21. RHOMBOSOLEA.

Eyes on the right side, the lower in advance of the upper. Mouth unsymmetrical, narrower on the right side than on the left, the length of the left maxillary being less than one-third of that of the head; teeth on the blind side only, where they are villiform, forming bands; no vomerine or palatine teeth. Most of the dorsal and anal rays branched. The dorsal fin commences on the foremost part of the snout. Only one ventral, which is continuous with the anal. Scales very small, cycloid; lateral line straight. Gill-openings narrow, the gill-membranes being broadly united below the throat; gill-rakers short, conical.

Coasts of New Zealand, Australia, and Van Diemen's Land.

1. Rhombosolea monopus.

B. 5. D. 59. A. 42.

The height of the body is contained once and four-fifths in the total length (without caudal), the length of the head thrice and two-thirds. Eyes separated by a naked space, the width of which is less than the vertical diameter of the eye; the lower eye is slightly in advance of the upper. Snout as long as the eye, the diameter of which is one-fifth of the length of the head. The maxillary of the right side extends to below the anterior margin of the eye; teeth in narrow bands. Jaws equal in front: the upper lip has a slight notch, in which the symphysis of the lower jaw is received. The cutaneous fold above the maxillary is not prolonged. The gill-opening does not extend upwards beyond the base of the pectoral. The dorsal fin commences on the foremost part of the snout, and terminates at a distance from the caudal which is rather more than one-half of the depth of the free portion of the tail; anterior dorsal rays produced beyond the connecting membrane, but considerably shorter than those behind the middle of the fin, which are nearly half as long as the head. Caudal fin slightly rounded, its length being one-sixth of the total. The six ventral rays are arranged in the same line with those of the anal fin, both fins being connected by a broad, complete, rayless membrane; the vent is situated on the blind side. The length of the pectoral is two-thirds of that of the head. Uniform brownish (in spirits); pectoral blackish posteriorly.

New Zealand.

a. Ten inches long. New Zealand. Presented by Prof. R. Owen.
b. Half-grown. Bay of Islands. Presented by A. Smith, Esq.
c. Half-grown. Australia. Presented by Sir J. Richardson.

2. Rhombosolea tapirina.

B. 6. D. 66. A. 50.

The height of the body is contained once and three-fourths in the total length (without caudal), the length of the head nearly three times. Eyes separated by a very narrow ridge, the lower being slightly in advance of the upper. Snout as long as the eye, the diameter of which is one-fifth of the length of the head; the maxillary of the right side extends to below the anterior margin of the eye; teeth in very narrow bands; jaws equal in front, overlapped anteriorly by a cutaneous flap half as long as the eye. Gill-opening and ventral fins as in *Rh. monopus*. The dorsal fin commences at the base of the rostral flap and terminates close by the caudal; the two anterior dorsal rays are prolonged beyond the connecting membrane, but much shorter than the longest rays, which are behind the middle of the fin and two-fifths of the length of the head. Caudal fin slightly rounded, its length being contained five times and a half in the total. The length of the pectoral is a little more than one-half of that of the head. Brown (in spirits), marbled with darker and spotted with white.

Australian Seas.

a. Eight inches long: skin. Australia.
b. Eight inches long: stuffed. King George's Sound.
c, *d*, *e*, *f–h*, *i–m*. Adult and half-grown. Auckland Islands. Presented by Sir J. Richardson.
n–q. Half-grown. Norfolk Bay, Tasmania. Presented by Sir J. Richardson.

3. Rhombosolea leporina.

B. 6–7. D. 65. A. 43.

The height of the body is contained twice and a third in the total length (without caudal), the length of the head four times. Eyes separated by a naked space, the width of which is less than the vertical diameter of the eye. The lower eye is in advance of the upper. Snout longer than the eye, the diameter of which is one-seventh or one-eighth of the length of the head. The maxillary of the right side extends to below the anterior margin of the eye; teeth in rather broad bands. The upper jaw slightly overlaps the lower, which is received in a notch of the upper lip. The cutaneous fold above the maxillary well developed, bearing the first dorsal rays. The gill-opening does not extend upwards beyond the base of the pectoral. The dorsal fin terminates at a distance from the caudal which is rather more than one-half of the depth of the free portion of the tail; anterior dorsal rays produced beyond the connecting membrane, with their tips split into two fine filaments, but considerably shorter than the rays behind the middle of the fin, the length of which is two-fifths of that of the head. Caudal fin rounded, one-sixth of the total length. Ventral and anal fins as in *Rh. monopus*. The length of the pectoral is not much more than one-half of that of the head. Uniform brownish (in spirits).

Australia.

a, *b*. Nine inches long. Presented by Sir J. Richardson.

22. PELTORHAMPHUS.

Mouth small, twisted towards the left side, toothless on the other; teeth minute, in two distant series on the left branches of the jaws; vomerine and palatine teeth none. Eyes on the right side, of moderate size; snout dilated, flat, sharp, bent downwards, hook-like. Dorsal and anal rays branched, naked. The dorsal fin commences on the foremost part of the snout. Pectorals well developed. The right ventral is continuous with the anal, the left very small. Scales small, ctenoid; lateral line straight. Gill-openings narrow, the gill-membranes being broadly united below the throat; gill-rakers short.

New Zealand.

1. Peltorhamphus novæ zeelandiæ.

B. 5. D. 92. A. 57. P. dextr. 11, sin. 7. V. dextr. 6, sin. 5.
L. lat. 78.

Brownish-olive, marbled with darker. Two blackish blotches on the lateral line.

New Zealand. Norfolk Island.

a. Eleven inches long. New Zealand. Presented by Sir J. Richardson.

b–f, *g*, *h–k*. Half-grown and young. New Zealand.

l. Half-grown. Norfolk Island. Presented by Sir J. Richardson.

Description.—The height of the body is contained twice and a third in the total length (without caudal), the length of the head thrice and a half. The anterior profile of the snout is subsemicircular, the snout being much dilated, flat, sharp, produced downwards into a curved hook-like appendage, which is bent so as nearly to reach the first ventral ray, and nearly entirely covers the right side of the cleft of the mouth; the extent of the snout is rather more than one-third of the length of the head. The mouth is twisted towards the left side and narrow; only the jaws of this side are armed with a double series of minute teeth. The eyes are situated on the same level, on the middle of the depth of the head; their distance from the snout equals two or three of their horizontal diameters, that from the gill-opening three or four. The interorbital space is scaly, and its width equals the vertical diameter of the eye in adult specimens, but is less in young ones. Pupil kidney-shaped. Nostrils before the interorbital space small, the anterior with a small tube. The whole of the right side of the head is scaly, whilst the greater portion of the left side is naked; a series of very small fringes runs from the left nostrils towards the neck. Gill-openings very narrow, the gill-membranes being broadly united below the throat; gill-rakers small, but distinct. Scales ctenoid, each scale having ten or more prominent spines on its margin; the scales on the blind side have fewer spines. Lateral line straight. Anal and dorsal rays naked, bifid. The dorsal fin commences on the extremity of the hook of the snout and terminates at a short distance from the caudal; its longest rays are above the end of the pectoral, and contained twice and two-thirds in the length of the head; its anterior rays are rather short, with their bifid tips extending beyond the membrane. The anal commences vertically a little before the pectoral, and is coterminal with the dorsal. The length of the rounded caudal is nearly one-sixth of the total. The right pectoral is very well developed, and has the second upper ray prolonged into a filament as long as the head; the left pectoral is considerably shorter. The right ventral is continuous with the anal fin, and has its rays disposed in the same way as the anal; its base occupies the whole throat, and is two-thirds as long as the head. The left ventral is very small, situated laterally and somewhat anteriorly to the vent. Brownish-olive, marbled with darker and dotted with black; two blackish blotches on the lateral line, one above the middle of the pectoral, the other further backwards; several of the anal and dorsal rays are entirely black. The left side whitish.

23. SOLEA[*].

Solea, Monochir, et Achirus (*Lacép.*, sp.), *Cuv. Règne Anim.*
Solea, Monochir, Grammichthys, Achirus, et Aseraggodes, *Kaup in Wiegm. Arch.* 1855, p. 94.

Eyes on the right side, the upper being more or less in advance of the lower. Cleft of the mouth narrow, twisted round to the left side. Teeth on the blind side only, where they are villiform, forming bands; no vomerine or palatine teeth. The dorsal fin commences on the snout, and is not confluent with the caudal. Scales very small, ctenoid; lateral line straight.

Inhabitants of all the temperate and tropical seas.

Although the extreme forms of this genus show differences of apparently sufficient importance for generic distinction, the intermediate species are so numerous, and form so gradual a transition from the true Soles with the pectorals fully developed to the *Achiri* proper, that we prefer to consider them as one genus. The following synopsis will show how it may be further subdivided.

I. The height of the body is two-fifths, or less than two-fifths, of the total length (without caudal).
  A. Pectorals of both sides developed.
    1. Nostrils of the blind side not dilated: *Solea*, p. 463.
    2. One of the nostrils of the blind side is dilated, broadly fringed: *Pegusa*, p. 467.
  B. Pectorals of both sides very small: *Buglossus*, p. 469.
  C. No pectoral on the blind side: *Monochir*, p. 470.
  D. No pectoral at all: *Aseraggodes*, pt., Kaup, p. 471.
II. The height of the body is more than two-fifths of the total length (without caudal).
  A. Pectorals developed: *Microbuglossus*, p. 471.
  B. Pectorals rudimentary or absent: *Achirus* (*Achirus*, Cuv. + *Aseraggodes*, pt., Kaup. + *Grammichthys*, Kaup), p. 472.

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[*] 1. Solea brasiliensis, *Kaup in Wiegm. Arch.* 1858, p. 95.—Montevideo.
2. —— angulosa, *Kaup*, *l. c.* p. 94.—Mediterranean.
3. —— ovata, *Cant. Catal.* p. 220 (not *Richards.*).—Pinang.—Caudal $12\frac{5}{4}$.
4. —— liturata, *Richards. in Trans. Zool. Soc.* iii. p. 156.—Australia.
5. Monochir punctifer, *Casteln. Anim. Nouv. Poiss.* p. 80. pl. 41. fig. 3 (bad).—Rio de Janeiro.
6. Solea cinerea, *Guichen. Explor. Algér. Poiss.* p. 106.—Algeria.
7. —— luctuosa, *Guichen. l. c.* p. 107.—Algeria.
8. Achirus pellucidus, *Benn. Whaling Voyage*, p. 277.—Pacific (open sea).
9. —— melanospilos, *Bleek. Celebes*, v. p. 257.—Amboyna and Celebes.—No mention is made of the structure of the scales.
10. Heteromycteris capensis, *Kaup in Wiegm. Arch.* 1858, p. 103.

I. The height of the body is two-fifths, or less than two-fifths, of the total length (without caudal).

A. Pectorals of both sides developed.

1. Nostrils of the blind side not dilated: *Solea.*

1. **Solea vulgaris.**

The Sole. Die Zunge.
Βούγλωσσος, *Athen.* vii. p. 288.
Solea, *Ovid.* v. 124; *Plin.* ix. c. 16.
Buglossus s. Solea, *Bellon. De Aquat.* p. 145; *Rondel.* xi. c. 11. p. 320; *Aldrov.* ii. c. 43. p. 235; *Gesner, Aquat.* iv. pp. 666, 671, and *Ic. Aquat.* p. 101; *Jonston,* i. tit. 3. c. 2. a. 2. punct. 1. p. 82; *Willughb. Hist. Pisc.* p. 100. tab. F. 7; *Ray,* p. 33; *Schonev.* p. 63.
Pleuronectes, sp., *Artedi, Synon.* p. 32. no. 8; *Genera,* p. 18. no. 6; *Species,* p. 60. no. 5; *Gronov. Zoophyl.* no. 251, and *Mus.* i. p. 14.
Pleuronectes solea, *L. Syst. Nat.* i. p. 457; *Brünn. Ichth. Mass.* p. 34; *Bl. Fische Deutschl.* ii. p. 42. taf. 45; *Bl. Schn.* p. 146; *Lacép.* iv. p. 623: *Donovan, Brit. Fish.* iii. pl. 52; *Turt. Brit. Faun.* p. 96; *Fries & Ekstr. Skand. Fisk.* p. 165. tab. 39; *Gronov. Syst. ed. Gray,* p. 89.
Solea, *Klein, Pisc. Miss.* iv. p. 31. no. 1, & p. 32. no. 2. tab. 2. fig. 3.
Sole, *Penn. Brit. Zool.* iii. p. 203, & ed. 1812, iii. p. 311.
La Sole, *Duhamel,* iii. sect. 9. p. 257. pl. 1.
Solea vulgaris, *Quensel in Vet. Akad. Handl.* 1806, p. 230; *Risso, Eur. Mérid.* iii. p. 247; *Flem. Brit. An.* p. 197; *Jen. Brit. Vert.* p. 467; *Gottsche in Wiegm. Arch.* 1835, p. 182; *Yarr. Brit. Fish.* 2nd edit. ii. p. 347, and 3rd edit. i. p. 657; *Parn. Wern. Mem.* vii. p. 378, or *Fish. Frith of Forth,* p. 218; *Bonap. Faun. Ital. Pesce*; *Holb. Götheb. Vet. Sällsk. Handl.* iv. p. 56. c. fig.; *Nilss. Skand. Faun. Fisk.* p. 651; *Costa, Faun. Nap.* ii. p. 34; *Canestr. Arch. Zool.* v. p. 41. tav. 4. fig. 2.

B. 7. D. 73–80. A. 61–69. L. lat. 160. Vert. 9/39–40.

The height of the body is contained twice and five-sixths in the total length (without caudal), the length of the head five times and a half; the space between the eyes is twice the vertical diameter of the eye (in the adult); nostrils very narrow on the blind side. Pectoral of the coloured side scarcely longer than that of the blind, its length being contained twice and a third in that of the head. Gill-rakers rudimentary. Dark brown; extremity of the pectoral blackish.

Coasts of Europe.

a. Adult. Dalmatia.
b–c. Half-grown. Lisbon. Presented by the Rev. R. T. Lowe.
d. Adult. Dingle Bay (Ireland). Presented by W. Andrews, Esq.
e. Adult: yellow variety. British Channel. Presented by Messrs. Oliffe and Cole.
f–g, h–i. Half-grown and young. Brighton.
k–l. Half-grown: skins. River Tamar. From Mr. Yarrell's Collection.
m. Adult: skin. South Devonshire. From Mr. Yarrell's Collection.
n. Large specimen: stuffed. Frith of Forth.
o. Half-grown: skin. Frith of Forth. From Dr. Parnell's Collection.
p. Half-grown: stuffed. British.

q. Half-grown: skin. From Gronow's Collection.
r, s, t. Adult, half-grown, and young.
u–y. Adult, half-grown, and young: skins.
z–a. Adult: skeletons. British.

Skeleton.—The bones are thin, slender or flexible, much less solid than in the preceding genera. The maxillary, intermaxillary, palatine, and pterygoid of the right side are very slender, those of the left side stout; the left intermaxillary is semicircularly bent, covered with villiform teeth on its concave surface. The right mandible is longer than the left, but the latter has a broad prominence covered with villiform teeth, and fitting into the concavity of the intermaxillary. The gill-covers are very broad, the suboperculum being the largest, and the interoperculum as large as the operculum. There is a rather low transparent ridge above the upper orbit, to which is attached the first interneural—a long styliform bone, which is longer and stronger than any of the other interneurals; it is situated perfectly horizontally.

The abdominal portion of the vertebral column is composed of nine vertebræ, and contained four times and three-fourths in the length of the caudal portion. The four anterior neural spines are dilated and rather strong; the seven posterior abdominal vertebræ are provided with strong hæmal spines, whilst the parapophyses and ribs are scarcely developed. This occurrence of well-developed hæmals of the abdominal vertebræ is, perhaps, unique in this and the preceding orders. Sometimes two interhæmals and interneurals correspond to a hæmal and neural, sometimes only one. The first interhæmal and hæmal rather feeble.

2. Solea kleinii.

Rhombus kleinii, *Risso, Eur. Mérid.* iii. p. 255.
Pleuronectes solea, var. *d*, *Nardo, Prodr. Ichth. Adr.* no. 136.
Solea kleinii, *Bonap. Faun. Ital. Pesce*; *Costa, Faun. Nap.* ii. p. 42. tav. 46; *Canestr. Arch. Zool.* i. p. 34. tav. 3. fig. 5.

D. 80. A. 64. P. 9. (*Bonap.*)
80–91. 64–70. 8. (*Canestr.*)

The height of the body is one-third of the total length (without caudal), the length of the head one-fifth. Eyes rather close together; nostrils on the blind side of moderate width. Pectoral of moderate size. Brownish, dotted with brown and white; vertical fins black; pectoral black, with white extremity. (*Bonap.*)

Adriatic and Mediterranean.

3. Solea senegalensis.

Kaup, l. c.

This species is characterized thus:—

D. 84. A. 70. P. 8.

Slightly elongate; blackish-brown; pectoral as long as the distance between eye and snout. Body and fin-rays rough. The lateral line is curved above the pectoral, and does not extend to the eye. Pectoral blackish at its extremity.

Senegal.

The typical specimen is in the Paris Museum.

4. Solea ocellata.

Solea oculata, *Rondel.* xi. c. 12. p. 322; *Gesner, Aquat.* iii. pp. 667, 669; *Aldrov.* ii. c. 43. pp. 235, 236; *Willughby*, p. 100. tab. F. 8. fig. 4; *Jonston*, ii. lib. i. tit. 2. c. 2. a. 2. punct. 1. p. 57. tab. 20. fig. 11.
Solea, no. 3, *Klein, Pisc. Miss.* iv. p. 32.
? Pégouse, *Duham.* iii. sect. 9. p. 259. tab. 2. fig. 4.
Pleuronectes ocellatus, *L. Syst. Nat.* i. p. 456†; *Bl. Schn.* p. 147. tab. 40; *Risso, Ichth. Nice*, p. 309; *Shaw, Zool.* iv. p. 307.
—— pegusa, *Lacép.* iv. p. 639.
—— rondeletii, *Shaw, Zool.* iv. p. 307.
Solea oculata, *Risso, Eur. Mérid.* iii. p. 248; *Bonap. Faun. Ital. Pesce*; *Valenc. in Webb & Berthel. Iles Canar. Poiss.* p. 84. pl. 18. fig. 2 (bad); *Costa, Faun. Nap.* ii. p. 45; *Canestr. Arch. Zool.* i. p. 37. tav. 4. fig. 1* (scale).

D. 67. A. 52. L. lat. 78.

The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head four times and three-fourths. Interorbital space very narrow; eyelids broad, thick, covered with rough scales. Nostrils on the blind side hidden between fringes. Pectoral of the coloured side more developed than that of the blind, its length being contained twice and a third in that of the head. Brownish-grey, with four black ocelli edged with white, disposed in a quadrangle behind the middle of the length of the fish; several other black blotches on the trunk, the hindmost of which is situated on the lateral line and is the most constant. Base of the caudal with a black cross-band‡, behind which is another of a light colour.

Mediterranean and the neighbouring parts of the Atlantic.

a. Fine specimen. Madeira. Presented by J. Y. Johnson, Esq.
b. Adult. Purchased of Mr. Frank.

5. Solea hexophthalma.

Bennett, Proc. Comm. Zool. Soc. i. p. 147.

D. 66. A. 49. L. lat. 88.

The height of the body is contained twice and a half in the total length (without caudal), the length of the head four times and a third. Interorbital space very narrow, its width being equal to the vertical diameter of the eye. Nostrils on the blind side hidden. Pectoral of the coloured side more developed than that of the blind, its length being one-half of that of the head. Brownish-olive, with darker and lighter cross-bands: three black ocelli edged with white along the base of the dorsal, and three others along that of the anal; the ocelli alternate with smaller round whitish spots. A very indistinct brown band across the root of the caudal.

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† Linnæus erroneously states Surinam as the native country of this species.

‡ This black band is mentioned by Linné, but omitted by Schneider and Bonaparte. Perhaps two species are confounded under the name of *S. ocellata*.

North-west coast of Africa.

a. Three inches long. From the Collection of the Zoological Society. —Type of the species.

6. **Solea microcephala.**

D. 79. A. 65. P. 11. L. lat. 90.

The height of the body is contained twice and three-quarters in the total length (without caudal), the length of the head nearly six times. Each scale with about thirteen spines on the margin. Jaws equal in length anteriorly; the nostril on the coloured side is prolonged into a tube as long as the eye; the left side of the snout with numerous short papillæ. Eyes very close together, the upper slightly in advance of the lower. Pectoral with broad base, not much shorter than the head; that on the left side is very short and attached to the gill-membrane by a fold; ventrals separate, not continuous with the anal. The dorsal and anal fins terminate immediately before the root of the caudal, their posterior rays extending beyond the middle of the caudal. Anterior dorsal rays short; caudal entirely free, its length being contained eight times and a half in the total. Brown, with eleven or thirteen dark cross-bands, broader than the interspaces: the first on the snout, the second immediately behind the eyes, the last across the root of the caudal; vertical fins black.

Australia.

a. Seven and a quarter inches long. From the Haslar Collection.
b. Six inches long. New South Wales. Presented by Dr. G. Bennett.

7. **Solea heterorhina.**

Solea heterorhinos, *Bleek. Act. Soc. Sc. Indo-Nederl.* i. *Amboina,* p. 64.
Soleichthys heterorhinos, *Bleek. Enumer.* p. 183.

D. 88–94. A. 80–82. P. 9–8. L. lat. 110.

Nasal tube elongate, longer than the eye. The height of the body is contained twice and four-fifths in the total length (without caudal), the length of the head six times to six times and two-fifths. Eyes contiguous, their diameter being one-third or less than one-third of the length of the head. The right pectoral is longer than the left, half as long as the head. Olive, with irregular blackish cross-bands, about seven on the head, and about sixteen on the body; most of the latter are geminate, curved, extending on the dorsal and anal fins. Vertical fins with yellow margin.

Celebes, Amboyna.

a. Five inches long. From Dr. P. v. Bleeker's Collection.

2. One of the nostrils of the blind side is dilated, broadly fringed.

8. Solea aurantiaca.

The Lemon Sole.

Solea pegusa, *Yarr. Zool. Journ.* iv. p. 467. pl. 16, and *Brit. Fish.* ed. 2. ii. p. 351; *Jen. Man.* p. 467 (not *Lacép.* or *Risso*).
—— nasuta, *Richards. in Yarr. Brit. Fish.* 3rd edit. i. p. 662 (not *Pall.*).

D. 89. A. 66. L. lat. 130. Vert. 46 *.

The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head five times and a fourth. The upper jaw slightly overlaps the lower, without being produced into a pointed, longish lobe. The width of the interorbital space equals the diameter of the eye. One of the nostrils on the blind side is very wide, circular, surrounded by a narrow ring of papillæ. The pectorals of both sides are nearly equal in length, and contained twice and a third in the length of the head. Yellowish, marbled with brown and speckled with black; pectoral with an ovate black spot on its hinder half.

Coasts of England and Portugal.

a. Adult. England. Presented by Mr. Yarrell.
b–c. Adult: stuffed. English coast.
d–e. Adult: skins. England. From Mr. Yarrell's Collection.
f. Half-grown: stuffed. Devonshire.
g. Adult: stuffed. Brixham.
h–l. Adult: skins. From Dr. Parnell's Collection.
m. Half-grown. Lisbon. Presented by G. Hough, Esq.

This species, confounded by Yarrell and other writers with *S. pegusa*, and by Sir J. Richardson with *S. nasuta*, is new to science.

9. Solea lascaris.

Pleuronectes lascaris, *Risso, Ichth. Nice*, p. 311. tab. 7. fig. 32.
? Pleuronectes theophilus, *Risso, l. c.* p. 313.
Solea lascaris, *Risso, Eur. Mérid.* iii. p. 249.
Rhombus polus, *Risso, l. c.* p. 480. fig. 32.
? Rhombus theophilus, *Risso, l. c.* p. 256.
Pleuronectes solea, var. *c*, *Nardo, Prodr. Adr. Ichth.* sp. 136.
Solea scriba, *Valenc. in Webb & Berth. Iles Canar. Poiss.* p. 84. pl. 18. fig. 3 (very bad, from a skinned specimen).

D. 85. A. 64. P. 11. L. lat. 150.

The height of the body is one-third of the total length (without caudal), the length of the head one-fifth. Upper jaw produced into a longish lobe, overhanging the lower. The width of the interorbital space equals the vertical diameter of the eye. One of the nostrils on the blind side is very wide, circular, surrounded by a broad wreath of fringes. Pectorals of both sides equal in length, half as long as the head. Gill-rakers rudimentary. Brown, variegated with black. A black ocellus edged with yellow on the extremity of the lower half of the pectoral.

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* Yarrell states 43 vertebræ; I have counted them in the same specimen in which Yarrell had laid bare the spine.

Mediterranean; Madeira.

a. Fine specimen. Madeira. Presented by the Rev. R. T. Lowe.

10. Solea impar.

? Pleuronectes nasutus, *Pall. Zoogr. Ross.-As.* p. 427.
Solea impar, *Benn. Proc. Comm. Zool. Soc.* i. p. 147.
—— lascaris, *Bonap. Faun. Ital. Pesce*; *Canestr. Arch. Zool.* i. p. 38. tav. 4. fig. 1 (not *Risso*).
—— nasuta, *Nordm. in Demid. Voy. Russ. Mérid. Zool.* iii. *Poiss.* pl. 31; *Kessler in Bull. Soc. Nat. Mosc.* 1859, part ii. p. 442.

D. 67. A. 53. L. lat. 115 (spec. Brit. Mus.).
70. 58. (*Bonap.*)
67–76. 54–59. (*Canestr.*)

The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head four times. Upper jaw produced into a longish lobe, overhanging the lower. The width of the interorbital space is rather less than the vertical diameter of the orbit. One of the nostrils on the blind side is very wide, circular, surrounded by a broad wreath of fringes. Pectorals of both sides equal in length, two-fifths of the length of the head. Greyish-brown, marbled and dotted with black. Pectoral with a black ocellus on the middle of its hinder half.

Mediterranean. North-west coast of Africa.

a. Six inches long. From the Collection of the Zoological Society. —Type of the species.

11. Solea margaritifera.

D. 82. A. 64. P. 8. L. lat. 100.

The height of the body is contained twice and four-fifths in the total length (without caudal), the length of the head five times. Upper jaw slightly hooked anteriorly. The width of the interorbital space is rather less than the vertical diameter of the orbit. One of the nostrils on the blind side is very wide, circular, surrounded by a broad wreath of fringes. Pectoral of the coloured side a little longer than that of the blind, half as long as the head. The length of the caudal is one-eighth of the total. Brownish-olive, with small black spots, regularly disposed in transverse and longitudinal series; most of them have a white spot in the centre. Lower half of the pectoral with a large ovate black ocellus edged with white.

Hab. —— ?

a. Six and a half inches long. (Borneo?) Presented by Vice-Admiral Sir E. Belcher, C.B.

This species is closely allied to *S. lascaris*, *aurantiaca*, and *impar*, which belong to the Mediterranean fauna. Therefore, although the typical specimen is stated to be from Borneo, I doubt whether this is correct. Sir E. Belcher has collected also on the N.W. coast of Africa.

B. Pectorals of both sides very small.

12. Solea variegata.

Pole panachée, *Duham.* iii. sect. 9. p. 259. pl. 2. fig. 3.
Pleuronectes variegatus, *Donov.* pl. 117.
—— microchirus, *Delaroche, Ann. Mus.* xiii. p. 356. fig. 2.
Monochir microchir, *Cuv. Règne Anim.*
Pleuronectes mangili, *Risso, Ichth. Nice,* p. 310.
—— lingula, *Penn. Brit. Zool.* ed. 1812, iii. p. 313. pl. 48.
Rhombus mangili, *Risso, Eur. Mérid.* iii. p. 255.
Pleuronectes fasciatus, *Naccari, Giorn. Fis. Pav.* iii. *Adr. Itt.* p. 9.
Solea mangilii, *Bonap. Faun. Ital. Pesce*; *Canestr. Arch. Zool.* i. p. 29. tav. 3. fig. 3.
Monochirus lingula, *Costa, Faun. Nap.* ii. p. 50.
—— variegatus, *Thomps. Ann. Nat. Hist.* ii. p. 404; *Yarr. Brit. Fish.* 2nd edit. ii. p. 353, and 3rd edit. i. p. 664.

D. 63–73. A. 53–57. L. lat. 85. Vert. 10/30.

The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head five times and a half. The width of the interorbital space equals the vertical diameter of the eye. None of the nostrils dilated. Pectoral of the coloured side very small, its length being two-ninths of that of the head; that of the blind side minute. Brownish-grey, with darker cross-bands, which are darkest on the dorsal and anal fins, where they form a series of about six blotches, the anterior of which occupy the base, the posterior the middle of those fins. Gill-rakers rudimentary.

Mediterranean. British coasts.

a. Adult: dried. Falmouth. Presented by W. J. Cocks, Esq.
b–f. Adult and half-grown: skins and stuffed. Plymouth.
g. Adult: skin. South Devon. From Mr. Yarrell's Collection.
h–i. Adult: stuffed. British.
k–l. Adult. England.
m–s. Adult, half-grown, and young: skins. From Mr. Yarrell's and Dr. Parnell's Collections.
t. Adult: skeleton: not good state. British.

13. Solea lutea.

Pleuronectes luteus, *Risso, Ichth. Nice,* p. 312.
Rhombus luteus, *Risso, Eur. Mérid.* iii. p. 257.
Pleuronectes trichodactylus, *Naccari, Ichth. Adr.* p. 11.
Monochirus luteus, *Costa, Faun. Nap.* ii. p. 49.
Solea lutea, *Bonap. Faun. Ital. Pesce*; *Canestr. Arch. Zool.* i. p. 32. tav. 3. fig. 4.

D. 65–70. A. 50–56. P. dextr. 5, sin. 3. L. lat. 60.

The height of the body is one-third of the total length (without caudal), the length of the head one-fourth. Eyes close together. Pectorals very small. Uniform yellowish; some of the dorsal and anal rays black.

Mediterranean.

a. Four inches long. Dalmatia.

14. Solea minuta.

? Solea parva s. lingula, *Rondel.* xi. c. 15. p. 324; *Gesner, Aquat.* iii. lib. iv. p. 669; *Aldrov.* ii. c. 43. p. 237; *Jonst. Pisc.* ii. lib. i. tit. 3. c. 2. a. 2. punct. 1. p. 58; *Willughb.* p. 102. tab. F. 8. fig. 1; *Klein, Pisc. Miss.* iv. p. 32. no. 4.
Solenette, *Duhamel,* iii. sect. 9. p. 258. pl. 2. figs. 1 & 2.
Monochirus minutus, *Parn. Mag. Zool. & Bot.* i. p. 527.
—— linguatulus, *Thomps. Ann. Nat. Hist.* ii. p. 405; *Yarr. Brit. Fish.* 2nd edit. ii. p. 355, and 3rd edit. i. p. 666 (not *Pl. linguatula,* L.).
Solea lingula, *Jen. Brit. Vert.* p. 468.
Synaptura lingula, *Kaup in Wiegm. Arch.* 1858, p. 97.

D. 73. A. 57. L. lat. 75.

The height of the body is one-third of the total length (without caudal), the length of the head one-fifth. Eyes close together. Dorsal and anal fins slightly continuous with the caudal. Pectorals minute. Reddish-brown; every sixth or seventh ray of the dorsal and anal fins black; lower half of the right pectoral black.

British coasts.

a. Five inches long: skin. From Mr. Yarrell's Collection.
b. Five inches long: stuffed: bad state. Brixham.

C. No pectoral on the blind side.

15. Solea monochir.

Pleuronectes pegusa, *Risso, Ichth. Nice,* p. 310 (not *Lacép.*).
Monochirus pegusa, *Risso, Eur. Mérid.* iii. p. 257. fig. 33.
Pleuronectes trichodactylus, *Nardo, Prodr. Adr. Ichth.* no. 138 (not *Naccari*).
Solea monochir, *Bonap. Faun. Ital. Pesce.*

D. 56–61. A. 44–49. P. 7. L. lat. 63.

No pectoral on the blind side; the upper rays of the right pectoral prolonged; ventrals separate from the anal fin. The height of the body is two-fifths of the total length (without caudal), the length of the head two-ninths; one of the nostrils on the coloured side produced into a long tube. Brown, with irregular black spots.

Mediterranean.

a. Adult: stuffed.
b. Half-grown.
c. Half-grown: skin. Mediterranean.
d. Fine specimen. Bay of Naples. Presented by S. P. Pratt, Esq.
e–f. Fine specimens Malta. From Dr. Gulia's Collection.

D. No pectoral fin at all.

16. Solea japonica.

Achirus japonicus, *Schleg. Faun. Japon. Poiss.* p. 186.

The height of the body is contained thrice and a sixth in the total length (with the caudal), the length of the head four times and a half. The width of the interorbital space is one-half the diameter of the orbit. The upper part of the snout hook-like. Ventrals contiguous with the anal. Uniform brown; fins spotted. (*Schleg.*)

Japan.

17. Solea hartzfeldii.

Achirus hartzfeldii, *Bleek. Amboina*, iii. p. 123.

D. 94–101. A. 63–65. L. lat. 100.

The height of the body is one-third of the total length (with the caudal), the length of the head one-fifth; the width of the interorbital space is less than the diameter of the eye. The upper part of the snout hook-like. Ventrals united with the base of the anal fin. Brownish (in spirits); five or six black ocelli, dotted with white, on, and nearly as many above and below, the lateral line; head, body and fins with scattered small black spots besides.

Amboyna.

a. From Dr. P. v. Bleeker's Collection.

II. The height of the body is more than two-fifths of the total length (without caudal).

A. Pectorals developed.

18. Solea humilis.

Solea humilis, *Cant. Catal. Mal. Fish.* p. 219.
—— maculata, *Bleek. Verhand. Bat. Genootsch.* xxiv. *Pleuron.* p. 17.

B. 6. D. 57. A. 42. L. lat. 95.

The height of the body is contained twice and a fifth in the total length (without caudal), the length of the head four times and a half. The width of the interorbital space is nearly equal to that of the orbit. Nostril on the blind side minute. The length of the pectoral of the coloured side is rather more than one-half of that of the head. Pale umber-brown, minutely dotted with black, and with numerous small blackish spots; an indistinct larger one close below the middle of the base of the dorsal, and a second at the posterior third; two corresponding spots near the base of the anal; near the point of the pectoral an oval, and between the two lowest rays a linear black spot.

Seas of Pinang, Java, and Bintang.

a. Type of the species: skin. From Dr. Cantor's Collection.
b. Adult. Pinang. From the Collection of the East India Company.—Named *S. ovata*, Cant.
c. Adult. From Dr. P. v. Bleeker's Collection, as *Solea maculata*, Blkr.

19. **Solea ovata.**

? Solea ovata, *Richards. Ichth. Chin.* p. 279 (not *Cant.*).

D. 60. A. 44. L. lat. 120.

The height of the body is contained twice and a fifth in the total length (without caudal), the length of the head four times. Eyes very close together; nasal opening on the blind side minute. Pectoral of the coloured side longer than that of the blind, its length being more than one-half of that of the head. Olive-brown, speckled with black dots, the dots near the base of the dorsal and anal forming irregular groups, alternating with round bluish spots, six along the base of the dorsal, and four along the base of the anal; one or two others of these bluish spots on the middle of the body; many dorsal and anal rays blackish; caudal with black spots. Pectoral with a round black spot near its extremity and with a black streak along its lower margin.

Chinese Seas.

a. Fine specimen (35 lines long). Amoy.

b–c, *d–e*. Adult and half-grown. China. Presented by Vice-Admiral Sir E. Belcher, C.B.

f. Adult. From the Haslar Collection.

B. Pectorals rudimentary or absent.

20. **Solea trichodactylus.**

Pleuronectes, *Artedi, Gen.* p. 18. no. 7; *Spec.* p. 61. no. 6.
Pleuronectes trichodactylus, *L. Syst.* i. p. 455; *Bl. Schn.* p. 147.
Solea trichodactylus, *Kaup in Wiegm. Arch.* 1858, p. 95.

D. 53. A. 43. P. dextr. 4, sin. 1.

Pectorals minute, composed of very fine hair-like rays. Snout without papillæ or tentacles. Brownish, variegated with darker. (*Art.*)

Amboyna.—The typical specimens were 30 lines long.

21. **Solea reticulata.**

Monochir reticulatus, *Poey, Mem. Cub.* ii. 1861, p. 317.

D. 54. A. 41. P. dextr. 4, sin. 1.

The left side of the head provided with fringes; body with scattered, short black filamentous appendages on the right side. The height of the body is a little more than one-half of the total length (with the caudal). Brown, reticulated with darker, and with eight black vertical lines; caudal yellowish, with some brown lines. (*Poey.*)

Cuba.

22. **Solea gronovii.**

? Pleuronectes, *Gronov. Mus. Ichth.* i. p. 25. no. 42, and *Zoophyl.* i. p. 73. no. 250.

? Pleuronectes lineatus, *Gronov. Syst. ed. Gray*, p. 90.

D. 62–67. A. 48. P. dextr. 3, sin. 1. L. lat. 80.

Pectorals rudimentary on both sides. The right ventral fin is composed of five rays, which are continuous with the anal. Scales on the nape and on the chin twice as large as those on the body; snout with a few fringes on the blind side; the right lower lip fringed. The height of the body is contained once and two-thirds in the total length (without caudal). The width of the interorbital space is nearly equal to, or rather more than, the diameter of the eye; the upper eye slightly in advance of the lower. The longest dorsal rays are in the posterior fifth of the fin, two-thirds of the length of the head. Caudal rounded, rather longer than the head. Brownish, irregularly spotted with darker, and with about ten black vertical lines crossing the lateral line.

Atlantic coasts of tropical America.

a. Fine specimen, $9\frac{1}{3}$ inches long. Surinam.
b, c. Adult and half-grown. Demerara.
d. Adult. West Indies. Purchased of Mr. Scrivener.

23. Solea inscripta.

Achirus inscriptus, *Gosse, A Natur. Soj. Jam.* p. 52. pl. 1. fig. 4.

D. 57. A. 42. P. dextr. 3, sin. 1. L. lat. ca 100.

Pectorals rudimentary on both sides; one ray of the right fin slightly prolonged. The right ventral fin is composed of five rays, the last of which is connected by a membrane with the base of the first anal ray. Scales on the nape and on the chin twice as large as those on the body; snout and neck densely fringed on the blind side; lips of the right side ciliated; body and tail with scattered filamentous appendages on the coloured side. The height of the body is contained once and three-fourths in the total length (without caudal). The width of the interorbital space is less than the diameter of the eye; the upper eye scarcely in advance of the lower. Yellowish-olive: head, body, dorsal and anal fins covered with a network of black lines; caudal fin yellowish, with a few brownish dots.

Jamaica.

a. Thirty-one lines long. From Mr. Gosse's Collection.—Type of the species.

24. Solea maculipinnis.

Monochir maculipinnis, *Agass. in Spix, Pisc. Bras.* p. 88. tab. 49 (not good); *Casteln. Anim. nouv. Poiss.* p. 79.
—— lineatus, *Quoy & Gaim. Voy. Uran. Zool.* p. 238; *Guichen. in Ramon de la Sagra, Hist. Cub. Poiss.* p. 168 (not *L.*).

D. 50–58. A. 41. P. 5. L. lat. 84.

No trace of a pectoral on the left side, that on the right with the upper rays somewhat prolonged. The right ventral fin is composed of five rays, which are continuous with the anal. Scales on the nape nearly twice as large as those on the body. Snout with a few fringes on the blind side; the right lower lip fringed. The height of the body is contained once and two-thirds in the total length (without the caudal). The width of the interorbital space is nearly equal to the diameter of the eye; the upper eye slightly in advance of the lower. Brownish: vertical fins with numerous rounded brown spots; body with similar but rather scattered spots, and with about eight vertical black lines. Young specimens with some round whitish spots on the body. The left side uniform whitish.

Atlantic coasts of tropical America.

a. Fine specimen. Cuba. From the Collection of the Zoological Society.
b–f. Adult and half-grown: skins. Jamaica. From Dr. Parnell's Collection.
g. Young. Bahia. From Dr. O. Wucherer's Collection.
h. Half-grown. Lindoagu. Presented by Lord Stuart de Rothesay.
i. Half-grown. Brazils. Museum Leach.
k, *l–m*. Adult and half-grown. South America.
n, *o–p*. Young and half-grown.

25. **Solea indica.**

D. 55. A. 44. P. 4. L. lat. ca 85.

No trace of a pectoral on the left side; that on the right not much longer than the eye. The right ventral is composed of four rays, which are continuous with the anal. Scales on the nape twice or thrice as large as those on the body. Jaws equal in length anteriorly. Head without tentacles or fringes. The height of the body is contained once and two-thirds in the total length (without caudal), the length of the head thrice and a fourth. The width of the interorbital space equals that of the eye, which is very small; upper eye in advance of the lower. Most of the rays of the vertical fins are branched, the longest dorsal rays being two-thirds of the length of the head. Caudal rounded, as long as the head. Uniform brownish (in spirits); dorsal and anal fins darker.

Madras.

a. Twenty-two lines long. Presented by T. C. Jerdon, Esq.

26. **Solea scutum.**

D. 55. A. 48. P. 3. L. lat. 80.

No trace of a pectoral on the left side; the right quite rudimentary, scarcely longer than the eye. The right ventral fin is composed of five rays, which are continuous with the anal. Scales on the nape nearly twice as large as those on the body. Snout with scarcely any fringes on the blind side; the right lower lip fringed. The height of the body is contained once and a half in the total length (without caudal), the length of the head thrice and two-thirds. The width of the interorbital space is less than the horizontal diameter of the orbit; the upper eye is slightly in advance of the lower. The longest dorsal rays are in the posterior third of the fin, two-thirds of the length of the head. Caudal rounded, longer than the head. Greyish: head, body and fins with numerous blackish, irregular, waving, sometimes bifurcate transverse bands, which are broader than the interspaces; caudal with rounded deep-black spots. The left side uniform white.

Pacific coast of Central America.

a. Fine specimen (58 lines long). Panama. From Mr. Fraser's Collection.

b, c–e. Adult and half-grown: bad state. Gulf of Fonseca. Presented by Sir J. Richardson.

?*f.* Eight and a half inches long. From the Haslar Collection.—This specimen is not in a good state of preservation, entirely black (perhaps artificially coloured), and has numerous fringes on the left side of the snout.

27. Solea mentalis.

D. 61. A. 45. P. 2. L. lat. 95.

No trace of a pectoral on the left side; that on the right quite rudimentary, scarcely longer than the eye. The right ventral fin is composed of five rays, which are continuous with the anal. A few scales on the nape are enlarged, and nearly twice the size of those on the body. Snout with short fringes on the blind side, but without elongate barbels; the right lower lip with inconspicuous fringes. Mental region very broad; lower jaw somewhat prominent. The height of the body is contained once and three-fourths in the total length (without caudal), the length of the head thrice and three-fourths. The width of the interorbital space is more than that of the orbit; the upper eye slightly in advance of the lower. The longest dorsal rays are in the posterior third of the fin, their length being a little more than one-half of that of the head; caudal fin rounded, shorter than the head. Yellowish-olive, marbled with brown; caudal with very small irregular brown spots. Blind side uniform yellowish.

Para.

a–b. Seven inches long. River Capin (Para). Purchased of Mr. Stevens.

28. Solea fonsecensis.

D. 58. A. 44. P. 2. L. lat. ca 85.

No trace of a pectoral on the left side; that on the right not much longer than the eye. The right ventral fin is composed of five rays, which are continuous with the anal. Scales on the nape twice or thrice as large as those on the body. The upper part of the snout slightly overlaps the lower jaw. The left anterior part of the head with numerous tentacles; the right lower lip with very distinct slender fringes; nostril on the right side in a wide and short tube. The height of the body is contained once and five-sixths in the total length (without caudal), the length of the head thrice and a third. The width of the interorbital space is less than the diameter of the eye; the upper eye is in advance of the lower. The rays of the vertical fins are branched; the longest dorsal rays are two-thirds of the length of the head. Caudal rounded, as long as the head. Brownish-olive, with six pairs of deep-brown vertical lines extending on the dorsal and anal fins.

Gulf of Fonseca.

a. Fifty-one lines long. Presented by Sir J. Richardson.

29. Solea achirus.

Pleuronectes achirus, *L. Syst. Nat.* 10th edit. i. p. 268.
—— lineatus, *L. Syst. Nat.* 12th edit. i. p. 458; *Bl. Schn.* p. 160; *Schoepf, Schrift. Gesellsch. Naturf. Freund. Berl.* viii. p. 149.
Achirus fasciatus, *Lacép.* iv. pp. 659, 662.
Pleuronectes mollis, *Mitch. in Lit. & Phil. Trans. New York*, i. p. 388. pl. 2. fig. 4.
Achirus lineatus, *Cuv. Règne Anim.*
—— mollis, *Storer, Syn. Fish. N. A.* p. 228, and *Fish. Massach.* p. 149; *Dekay, New York Fauna, Fish.* p. 303. pl. 49. fig. 159.
Grammichthys lineatus, *Kaup in Wiegm. Arch.* 1858, p. 101.

B. 5. D. 54–55. A. 40–42. L. lat. 72–77. Vert. 10/19.

Pectorals none. The right ventral fin is composed of four rays, which are continuous with the anal. Scales on the nape and on the chin three or four times as large as those on the body. Nostril of the blind side small, surrounded by a broad wreath of fringes; the right lower lip fringed. The height of the body is contained once and four-fifths in the total length (without caudal). The width of the interorbital space equals the diameter of the eye; the upper eye slightly in advance of the lower. Blackish-brown, with about eight black vertical lines; the left side spotted with brown.

Atlantic coasts of the United States.

a, b. Adult. New York.
c. Half-grown. North America. Presented by the Smithsonian Institution.
d. Adult: skeleton. New York. Purchased of Mr. Brandt.

A skin of an adult specimen belonging to Linné's own collection, and named by himself *Pleuronectes lineatus*, is in the possession of the Linnean Society of London.

30. Solea jenynsii.

Achirus lineatus, *D'Orb. Voy. Amér. Mérid. Poiss.* pl. 16. fig. 2; *Jenyns, Voy. Beagle, Fish.* p. 139.

Pectorals none. The right ventral is composed of five rays, which are continuous with the anal. Two long barbels at the extremity of the upper jaw; the lower jaw prominent. The height of the body is contained once and two-thirds in the total length (without caudal); the upper eye is slightly in advance of the lower. Body with vertical black lines crossing the lateral line.

Rio Plata.

31. Solea brownii.

Pleuronectes, *Brown, Jamaica*, p. 445. no. 1.
Passer, *Ray, Syn.* p. 157. no. 1; *Sloane, Jam.* ii. p. 277. tab. 246. fig. 2 (bad); *Klein, Pisc. Miss.* iv. p. 34. no. 7.
Rhombotides, sp., *Klein, Pisc. Miss.* v. p. 92. no. 15.

D. 54. A. 42. L. lat. 85.

Pectorals none. The right ventral is composed of three rays, which are continuous with the anal. Scales on the nape four or five times as large as those on the body; those on the chin half as large as those on the neck. The left side of the neck covered with very large scales, the left side of the snout with a few broad short fringes; the left nostril surrounded by some fringes; no prominent barbels on the upper jaw; the right lower lip fringed. The height of the body is contained once and two-thirds in the total length (without caudal), the length of the head thrice and a half. The width of the interorbital space equals the diameter of the eye; the upper eye is slightly in advance of the lower. Caudal rounded, its length being contained four times and a fourth in the total. Brownish, with about eight black vertical lines and with scattered roundish brown spots. The membrane between nearly every second pair of rays of the vertical fins is brown. The blind side is immaculate whitish.

Atlantic coasts of the Southern States of North America.

a. Sixty-three lines long. New Orleans. From M. Sallé's Collection.
b. Half-grown. Texas. Purchased of Mr. Brandt.

32. Solea guttulata.

Aseraggodes guttulatus, *Kaup in Wiegm. Arch.* 1858, p. 103.

D. 64. A. 42.

The height of the body is one-half of the total length*, the length of the head one-fifth. Eyes close together. About forty-eight scales in a transverse series. Grey, with darker spots and streaks. (*Kaup.*)

Hab. —— ?

33. Solea fimbriata.

D. 46. A. 33. L. lat. ca 70.

Pectorals none. The right ventral is composed of five rays, which are continuous with the anal. Scales on the nape four times, those on the chin twice as large as those on the body. Upper part of the snout slightly bent downwards over the mandible, and forming a short hook; the right lower lip is broadly fringed, each fringe being serrated; the nostril is in a short, wide, fringed tube. No tentacles on the left side of the head. The height of the body is two-thirds of the total length (without caudal), the length of the head nearly one-third. The width of the interorbital space equals the diameter of the circular small orbit; the upper eye is slightly in advance of the lower. The longest dorsal rays are two-thirds of the length of the head. Rays of the vertical fins branched; caudal rounded, its length being one-fourth of the total. Brown: head and body with numerous large, rounded or kidney-shaped white spots edged with dark brown.

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* Hr. Kaup says that his genus *Aseraggodes* comprises rather oblong species; but the present species is one of those which evidently has the body much elevated.

Gulf of Fonseca.

a. Thirty-eight lines long. Presented by Sir J. Richardson.

34. **Solea thepassii.**

Achirus thepassii, *Bleek. Amboina,* v. p. 500.

D. 67. A. 46. L. lat. 80.

Dorsal and anal fins simple, or bifid at the top only. The height of the body is contained twice and two-thirds to twice and three-fourths in the total length (with the caudal). Eyes subcontiguous. Violet-olive, with numerous small brown dots, with two large irregular brown blotches on the lateral line, and with four similar spots along the back.

East Indian Archipelago.

a. Twenty-nine lines long. From Dr. P. v. Bleeker's Collection.—This specimen has 80 distinct transverse series of scales, and not 65 as stated by Bleeker.

Achirus poropterus, Bleek. Verhand. Batav. Genootsch. Pleuron. p. 19, or Natuurk. Tydschr. Nederl. Ind. i. p. 410, appears to be scarcely different from *S. thepassii*; it has a more uniform coloration and a rather lower body.

a. Twenty-four lines long. From Dr. P. v. Bleeker's Collection.

24. PARDACHIRUS.

Achirus, sp., *Auct.*

Eyes on the right side, the upper in advance of the lower. Mouth unsymmetrical, narrow, narrower on the left side than on the right; teeth minute, on the blind side only. Dorsal and anal rays scaly; the dorsal commences on the extremity of the snout and terminates at the root of the caudal. Pectorals none. Two separate ventrals. Scales small, not ciliated, or only a few with inconspicuous cilia; lateral line straight,—a second on the blind side along the upper profile of the neck, commencing from the snout; each dorsal and anal ray with a pore at the base. Gill-openings narrow, the gill-membranes being broadly united below the throat; gill-rakers rudimentary.

Indian Ocean and Archipelago.

1. **Pardachirus marmoratus.**

?? Pleuronectes, sp., *Gronov. Zoophyl.* no. 255.
?? Pleuronectes albus, *Bl. Schn.* p. 159.
?? Achirus barbatus, *Lacép.* iv. pp. 658, 660.
Achirus marmoratus, *Lacép. l. c.*

Achirus barbatus, *Geoffr. Ann. Mus.* i. p. 152. tab. 11; *Rüpp. Atl. Fische,* p. 122. tab. 31. fig. 2.
? Pleuronectes maculosus, *Gronov. Syst. ed. Gray,* p. 89.

D. 67. A. 53. L. lat. 100.

Dorsal and anal rays branched. None of the scales are ciliated. The height of the body is contained twice and two-thirds in the total length (without caudal). Greyish-olive, with numerous brown dots on the body, head and fins, and with scattered white ocelli edged with brown and with a brown spot in the centre.

Eastern coasts of Africa.

a, b. Fine specimens. Red Sea.
c. Adult. Madagascar. Presented by Dr. J. E. Gray.

2. Pardachirus pavoninus.

Achirus pavoninus, *Lacép.* iv. pp. 658, 661; *Cant. Catal.* p. 225; *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 18.
Pleuronectes pavoninus, *Shaw, Zool.* iv. p. 310.

D. 67. A. 50–52. L. lat. 90.

Dorsal and anal rays branched. Only the scales on the head and a few on the body minutely ciliated. The height of the body is two-fifths or one-third of the total length (without caudal). Yellowish-brown; the head and body with numerous larger and smaller rounded white spots, edged and minutely dotted with dark-brown, and with a round black dot in the centre; vertical fins with numerous whitish ocelli.

East Indies.

a. Adult: skin. Pinang. From Dr. Cantor's Collection.
b. Half-grown. Singapore. From Dr. Cantor's Collection.
c. Adult: has been in chloride of zinc. Moluccas. Purchased of Mr. Frank.
d–e. Half-grown: not good state. Old Collection.

25. LIACHIRUS.

Eyes on the right side, the upper in advance of the lower. Mouth unsymmetrical, narrow, narrower on the left side than on the right; teeth minute, on the blind side only. Dorsal and anal rays naked, without pores at the base; the dorsal commences on the extremity of the snout, and terminates at the root of the caudal. Pectorals none. Two separate ventrals. Scales small, not ciliated; lateral line straight,—a second on the blind side along the upper profile of the neck, commencing from the snout. Gill-openings narrow, the gill-membranes being broadly united below the throat.

Chinese Seas.

1. Liachirus nitidus.

D. 63. A. 50. L. lat. 75.

The height of the body is contained twice and two-fifths in the total length (without caudal), the length of the head four times. The cleft of the mouth terminates below the front margin of the eye; the upper portion of the snout slightly overlaps the mandible; chin with a series of small barbels. The width of the interorbital space equals the diameter of the eye; the upper eye slightly in advance of the lower. The dorsal and anal rays are naked, each of them having only one small scale at its base. The longest dorsal rays are more than half as long as the head, and stand near the end of the fin; caudal rounded, one-fifth of the total length. The ventrals are nearly equally developed, each being composed of five rays. Reddish-olive, with numerous small and large irregular brown spots, edged with series of dark-brown dots. Vertical fins with brown spots.

China.

a–b, c. Four inches and two and a half inches long. Presented by Vice-Admiral Sir E. Belcher, C.B.

26. SYNAPTURA*.

Synaptura, *Cant. Catal. Mal. Fishes*, p. 222.
Achiroides, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 6.
Synaptura, Æsopia, Euryglossa, et Eurypleura, *Kaup.*

Eyes on the right side, the upper in advance of the lower. Cleft of the mouth narrow, twisted round to the left side; teeth minute, on the blind side only; no vomerine or palatine teeth. Vertical fins confluent. Scales small, ctenoid; lateral line straight.

Indian Ocean and Archipelago. (Mediterranean.)

The species of this genus may be subdivided in a similar way to those of *Solea*:—

A. One of the nostrils on the blind side is dilated, p. 480.
B. No dilated nostril on the blind side.
    1. Pectoral fins developed on both sides, the right being more or less the longer.
        a. Nasal tube small or simple: *Synaptura*, Kaup, p. 481.
        b. Nasal tube bifid: *Euryglossa*, Kaup, p. 484.
    2. The left pectoral fin is rudimentary: *Æsopia* (pt.), Kaup, p. 484.
    3. The left pectoral is longer than the right: *Anisochirus*, p. 486.
    4. Both pectorals are absent: *Achiroides*, Bleeker, p. 486.

A. One of the nostrils on the blind side is dilated.

1. Synaptura savignyi.

Synaptura savignyi, *Kaup in Wiegm. Arch.* 1858, p. 97.

D. 72. A. 58–60. C. 18. P. 8.

A large round nostril on the blind side. The height of the body is one-third of the total length (with the caudal), the length of the head one-fifth. The upper jaw overhanging the lower. Pectorals equal in length, as long as their distance from the eye. Greenish-brown, marbled with darker. (*Kaup.*)

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* 1. Jerre potoo B., *Russell*, pl. 71.—Solea jerreus, *Cuv. Règne Anim.*—Coromandel.

Naples.

B. No dilated nostril on the blind side.

1. Pectoral fins developed on both sides, the right being more or less the longer.

a. Nasal tube small or simple.

2. Synaptura pan.

Pleuronectes pan, *Ham. Buch. Gang. Fish.* p. 130. pl. 24. fig. 42.
Solea pan, *Bleek. Nat. Tydschr. Nederl. Ind.* i. p. 410.
Synaptura pan, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 30.
Pleuronectes canus, *Gronov. Syst. ed. Gray*, p. 91.

D. 59. A. 45. C. 14. P. 5. L. lat. 75.

The height of the body is contained twice and a third in the total length (with the caudal), the length of the head five times and a half. Scales on the neck much larger than those on the body. The upper jaw slightly overlapping the lower. The right pectoral is two-sevenths of the length of the head; the left is shorter, also composed of five rays. Brown, with irregular black spots, and with five or six short black lines falling at right angles on the upper side of the lateral line.

Ganges, Bintang, Singapore, Biliton.

a. Adult (5 inches long). India. Presented by W. Masters, Esq.
b. Half-grown. India. Presented by General Hardwicke.

3. Synaptura foliacea.

Solea foliacea, *Richards. Ichth. Chin.* p. 279.
—— ovalis, *Richards. l. c.* (from an incorrect drawing).

D. 62. A. 46. C. 16. P. 7. L. lat. 82.

The upper eye is slightly in advance of the lower. The height of the body is one-half, or a little less than one-half, of the total length (with the caudal), the length of the head two-ninths. Scales on the neck not larger than those on the body; the upper jaw slightly overlapping the lower. The right pectoral is longer than the left, and one-third of the length of the head. Brownish, with four pairs of lines placed at right angles on the upper side of the lateral line; they indicate cross-bands, which again become distinct on the dorsal fin; a black blotch corresponds to each of these bands on the dorsal and ventral side; sometimes there are small whitish spots in addition.

Chinese Seas.

a–b. Four and a quarter inches long. China.
c. Eight and a half inches long: stuffed. China. Presented by J. R. Reeves, Esq.

4. Synaptura marmorata.

Synaptura marmorata, *Bleek. Solor,* p. 90.

D. 64. A. 50. C. 14. P. 7–8. L. lat. 100.

The height of the body is contained twice and three-quarters in the total length (with the caudal), the length of the head five times. The right pectoral is longer than the left, and one-fourth of the length of the head. Greyish, marbled with bluish; margins of the fins light-coloured. (*Bl.*)

Solor.

5. Synaptura cinerascens.

D. 68. A. 51. C. 16. P. 9. L. lat. 95.

The height of the body is contained twice and a third in the total length (with the caudal), the length of the head five times and two-thirds. Scales ciliated on both sides of the body, those on the neck not larger than those on the body; jaws subequal in length anteriorly. The width of the interorbital space is rather less than the diameter of the eye. The pectoral of the right side is longer than that of the left, its length being contained twice and two-thirds in that of the head; the last dorsal and anal ray extends to the middle of the length of the caudal. Nasal tube short. Grey, with several very indistinct vertical blackish lines crossing the lateral line.

Ceylon.

a. Fine specimen, 5½ inches long. Ceylon. Purchased of Mr. Cuming.

6. Synaptura heterolepis.

Bleek. Act. Soc. Sc. Indo-Nederl. i. *Amboina,* p. 65.

D. 67. C. 13. A. 50. P. 6. L. lat. 98.

The height of the body is two-fifths of the total length (with the caudal), the length of the head two-elevenths. Scales on the neck not larger than those on the body; scales on the blind side not ciliated, emarginate. The upper jaw overlapping the lower. The width of the interorbital space is rather more than the diameter of the eye. The length of the right pectoral is one-third of that of the head. Some of the scales with cutaneous filaments. Brown, marbled with blackish and irregularly spotted with whitish. Pectoral black.

Amboyna.

a. Fine specimen. From Dr. P. v. Bleeker's Collection.
b. Adult. Amboyna. Purchased of Mr. Frank.

7. Synaptura aspilos.

Synaptura aspilos, *Bleek. Natuurk. Tydschr. Nederl. Ind.* iii. p. 74, and *Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 29.

D. 70. A. 55. C. 12. P. 6. L. lat. 115.

The height of the body is contained twice and three-fourths in the total length (with the caudal), the length of the head five times and a third. Scales on the neck not larger than those on the body.

The upper jaw overlapping the lower. The right pectoral is longer than the left, one-fourth of the length of the head. Black or brown, immaculate; vertical fins edged with yellow.

Singapore.

a. Adult. From Dr. P. v. Bleeker's Collection

8. Synaptura albomaculata.

Synaptura albomaculata, *Kaup in Wiegm. Arch.* 1858, p. 96.

D. 74. A. 59. C. 16. P. 7–8.

The height of the body is one-third of the total length, the length of the head one-sixth. A barbel between the two prominent nostrils. The length of the pectoral equals that of the snout. There are 38 series of scales above the lateral line, and 45 below. Body with five rows of yellowish-white dots. (*Kaup*.)

Coromandel.

? *a*. Twelve inches long: stuffed. East Indies.—The bad condition of the specimen, which is much deformed by stuffing, and the insufficiency of Dr. Kaup's description do not admit of an accurate determination of this specimen; it has 105 transverse series of scales.

9. Synaptura commersoniana.

? Pleuronectes commersonianus, *Lacép.* iii. pl. 12. fig. 2 (not iv. p. 656).
Russell, pl. 70 (incorrect).
? Solea commersoniana, *Cuv. Règne Anim.*
Synaptura commersoniana, *Cant. Catal.* p. 222.
Solea russellii, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 15.

D. 78–81. A. 65–66. C. 12. P. 6. L. lat. 170.

The height of the body is one-fourth of the total length (with the caudal), the length of the head one-sixth or one-seventh. The upper jaw slightly overlaps the lower. The length of the pectorals is one-fifth of that of the head. Brownish-olive; vertical fins darker, edged with white; pectoral black, with buff margin.

East Indies.

a–b. Adult and half-grown: skins. Pinang. From Dr. Cantor's Collection.
c. Adult. From Dr. P. v. Bleeker's Collection, as *S. russellii*.

10. Synaptura pectoralis.

Synaptura pectoralis, *Kaup in Wiegm. Arch.* 1858, p. 96.

D. 116. A. 87. C. 18. P. 7–9.

The right pectoral is one-third longer than the left, and longer than the head. The height of the body is one-fourth of the total length, the length of the head one-seventh. (*Kaup*.)

Cape of Good Hope.

b. Nasal tube bifid.

11. Synaptura orientalis.

? Pleuronectes orientalis, *Bl. Schn.* p. 157.
Euryglossa orientalis, *Kaup in Wiegm. Arch.* 1858, p. 99.

D. 66. A. 48. C. 19. P. 9.

Nasal openings on two branches of a bifid tube. The height of the body is contained once and six-sevenths in the total length (with the caudal), the length of the head five times and an eighth. Interorbital space concave, as wide as the diameter of the lower eye. About eighty scales in a transverse series. (*Kaup.*)

East Indies.

2. The left pectoral fin is rudimentary.

12. Synaptura zebra.

Pleuronectes zebra, *Bl. Ausl. Fische*, iii. p. 27. tab. 187 (bad); *Bl. Schn.* p. 151; *Lacép.* iv. p. 597; *Shaw, Zool.* iv. p. 305. pl. 44.
Solea zebra, *Cuv. Règne Anim.*; *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 16.
—— zebrina, *Schleg. Faun. Japon. Poiss.* p. 186. pl. 95. fig. 1.
—— ommatura, *Richards. Ichth. Chin.* p. 279.
Synaptura zebra, *Cant. Catal. Mal. Fish.* p. 224.
Pleuronectes fasciatus, *Gronov. Syst. ed. Gray*, p. 91.

D. 77–89. A. 66–79. C. 13–15. L. lat. 126–128. Vert. 8/41.

The upper eye is slightly in advance of the lower. The height of the body is one-third, or more than one-third, of the total length (with the caudal), the length of the head one-seventh. Jaws equal in length anteriorly; nasal tube very short. The upper part of the right pectoral is prolonged, equal in length to its distance from the front margin of the eye. The gill-membrane on the left side is dilated into a flap, the flap being annexed to the pectoral, which is very short, but rather broad. Reddish-olive, with twelve pairs of brown bands: the first across the snout, the second behind the eyes, the third across the gill-opening; the bands of the posterior pairs sometimes confluent into simple bands. Caudal brownish-black, with some irregular roundish white spots.

Indian and Chinese Seas.

a–c. Fine specimens. Amoy.
d–e, f, g, h, i, k. Adult, half-grown, and young. China.
l. Young. East Indies. From the Collection of the East India Company.
m–n. Half-grown: skins. Pinang. From Dr. Cantor's Collection.
o–p. Adult: bad state. Presented by Sir A. Smith.
q. Adult: skeleton. Amoy.

The *skeleton* does not differ essentially from that of *Solea.* The opercles are less dilated. The hæmal spines of the four posterior abdominal vertebræ are rather long.

13. Synaptura multifasciata.

Æsopia multifasciata, *Kaup in Wiegm. Arch.* 1858, p. 97.

D. 93. A. 67. P. 7–10. L. lat. 110.

The height of the body is one-third of the total length (with the caudal), the length of the head one-seventh. Eyes contiguous. Nasal tube longer than the eye. The two longest rays of the pectoral are longer than the diameter of the lower eye. Head and body with twenty-seven narrow cross-bands. (*Kaup.*)

East Indies.

14. Synaptura japonica.

Æsopia japonica, *Bleek. Japan,* vi. p. 71.

D. 79. A. 65. C. 17. P. 7–8. L. lat. 110.

Vertical fins united at the base; the upper eye is slightly in advance of the lower. The height of the body is one-third of the total length, the length of the head one-seventh. Eyes subcontiguous; nasal tube as long as the eye. The upper rays of the right pectoral produced, the left pectoral rudimentary. Yellowish-grey, with twelve pairs of brown cross-bands, each lighter along the middle. Caudal yellowish on its basal portion, and deep-black on its posterior third, without yellow spots. (*Bl.*)

Nagasaki.

15. Synaptura quagga.

? Æsopia quagga, *Kaup in Wiegm. Arch.* 1858, p. 98.

D. 68. A. 58–60. C. 18. P. 9. L. lat. 90.

The upper eye is slightly in advance of the lower. The height of the body is rather less than one-third of the total length (with the caudal), the length of the head somewhat less than one-sixth. Jaws equal in length anteriorly; nasal tube not prolonged; eyes contiguous (each with a small tentacle). The upper rays of the right pectoral are prolonged, two-thirds of the length of the head; the left pectoral is very short, but rather broad. The gill-membranes are dilated on both sides and annexed to the pectorals. Yellowish, with eleven brown cross-bands, broader than the interspaces: only the anterior bands are more or less geminate: the first across the snout, the second behind the eyes, the third across the gill-opening, the last separated by a white band from the caudal. Caudal blackish-brown, with a pair of black ocellated spots, edged with white, on its posterior half.

China.

a. Four inches long. China. Presented by Vice-Admiral Sir E. Belcher, C.B.

b. Five inches long: not good state. China. Presented by Sir J. Richardson.—Orbital tentacles none.

c. Five inches long: dried. China.

3. The left pectoral is longer than the right.

16. **Synaptura panoides.**

Synaptura panoides, *Bleek. Borneo,* v. p. 440, or *Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 30.

D. 82–83. A. 63–67. C. 14–16. P. dextr. 2–3, sin. 4–5.
L. lat. 105–115.

The left pectoral is longer than the right; the upper eye is in advance of the lower. The height of the body is contained thrice in the total length (with the caudal), the length of the head six times and a half. Nasal tube short; eyes very small, their diameter being much less than the width of the space between them; the right pectoral is minute, scarcely longer than the eye; the length of the left is one-fifth of that of the head. Brownish-olive, with six pairs of rather remote blackish lines, crossing the body in its whole width, vertically to the lateral line *. Sometimes large irregular blackish blotches within and without these lines.

Bandjermassing. Singapore?

a. Fine specimen: 8 inches long. Singapore?
b. Fine specimen. From Dr. P. v. Bleeker's Collection.

17. **Synaptura macrolepis.**

Synaptura macrolepis, *Bleek. Borneo,* xii. p. 7.

D. 69–70. A. 52. C. 16. P. dextr. 3–4, sin. 5. L. lat. 65.

The right pectoral is smaller than the left. The height of the body is contained twice and three-quarters in the total length (with the caudal), the length of the head five times and three-quarters. Eyes contiguous. The length of the left pectoral is contained five times and a half in that of the head. Uniform yellowish-olive. (*Bl.*)

Sea of Singkawang.

4. Both pectorals are absent.

18. **Synaptura leucorhyncha.**

Achiroides leucorhynchus, *Bleek. in Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 20.

D. 54. C. 17. A. 36. V. 3–4. L. lat. 60.

Pectorals none. The height of the body is two-fifths of the total length (with the caudal), the length of the head two-ninths. The width of the interorbital space is less than the diameter of the eye; the upper eye is considerably in advance of the lower. Ventral fins free. Brown, clouded with darker. (*Bl.*)

Rivers of Surakarta (Central Java).

a. One inch long. From Dr. P. v. Bleeker's Collection.

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* These lines are apparently the remainder of cross-bands with dark edges.

19. Synaptura melanorhyncha.

Plagusia melanorhynchus, *Bleek. in Natuurk. Tydschr. Nederl. Ind.* i. p. 15.
Achiroides melanorhynchus, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 19.

D. 56–61. A. 42–43. C. 16–20. V. 4. L. lat. 60–65.

Pectorals none. The height of the body is two-fifths of the total length (with the caudal), the length of the head one-fifth or two-ninths. The width of the interorbital space is nearly equal to the diameter of the eye; the upper eye is in advance of the lower. Ventral fins free. Brownish, with three black spots along the base of the dorsal, and with two or three along that of the anal. The left side is whitish; the snout only is sometimes deep black.

Rivers of Sumatra, Borneo, and Gamboja.

a. Forty lines long. From Dr. P. v. Bleeker's Collection.
b. Twenty-two lines long. Gamboja. From M. Mouhot's Collection.

27. ÆSOPIA.

Æsopia, sp., *Kaup.*

This genus appears to agree in its characters with *Synaptura*, but the scales are said to be smooth.

East Indies.

According to the rules of nomenclature, the name of *Æsopia* ought not to be retained for the following single species, but for the five other species which Hr. Kaup has referred to that genus. But as we are inclined to consider those five species as belonging properly to the genus *Synaptura*, we rather prefer to apply a name once used, than to introduce a new one for a species so little known as the following. We have too frequently had occasion to lament the practice of those who, without knowing a species or even the forms allied to it, pick out of the description some character, on which they base a genus which will never find place in the system otherwise than as a useless synonym.

1. Æsopia cornuta.

Russell, pl. 72 (bad).
Solea cornuta, *Cuv. Règne Anim.*
Æsopia cornuta, *Kaup in Wiegm Arch.* 1858, p. 95.

D. 72. A. 62. C. 17. P. 10. V. 3–4.

Scales without spines. Vertical fins confluent. The first dorsal ray is prolonged; pectoral rudimentary. Twelve or thirteen cross-bands, the first on the snout; caudal with black and grey markings, and with a white dart-shaped spot before the black extremity. (*Kaup.*)

British India.

28. GYMNACHIRUS.

Gymnachirus, *Kaup in Wiegm. Arch.* 1858, p. 101.

Mouth very small, with the jaws toothless, and hidden behind the thick skin. Scales none; lateral line straight. Eyes on the right side, of moderate size. Dorsal and anal rays branched; the dorsal commences on the snout; caudal free. Pectorals rudimentary or entirely absent; only the right ventral is present and continuous with the anal. Gill-openings very narrow, the gill-membranes being broadly united below the throat.

Tropical parts of the Atlantic.

1. **Gymnachirus nudus.**

Kaup, l. c.

D. 51. A. 42. V. 5.

Pectorals none. Somewhat longer than high. Body with fourteen black cross-bands; irregular concentrical rings round the eyes; caudal with two black bands anteriorly and with white margin. (*Kaup.*)

Bahia.

The typical specimen is in the Paris Collection.

2. **Gymnachirus fasciatus.**

D. 68. A. 50. P. 2. V. 5.

The right pectoral is extremely small, the left absent. Body with alternate broader and narrower cross-bands.

Hab. ——?

a. Seven and one-third inches long. From the Collection of the Zoological Society.—Perhaps from Cuba.

Description.—In general habit similar to *Solea achirus*, L. The height of the body is contained twice in the total length (with the caudal), the length of the head five times and a half. The anterior profile is subsemicircular. The cleft of the mouth extends further backwards on the right side than on the left, but does not reach to the vertical from the orbit. The lower lip and the cutaneous edge of the upper jaw are slightly fringed; the latter is pierced by a rather wide, short, tubiform nostril, which is in front of the angle of the mouth. The jaws are entirely hidden behind the cutaneous edges of the mouth, and twisted towards the right side. The left side of the snout and of the nape are densely covered with fringes, which form a sort of network. The eyes are contiguous, situated on the same level, twice as remote from the pectoral as from the snout. The gill-opening does not extend upwards to the pectoral. The whole of the anterior and superior profiles of the head is surrounded by a series of fringes, which gradually pass into the dorsal rays proper. Fins enveloped in thick skin. The dorsal and anal terminate immediately before the root of the caudal. Caudal rounded, as long as the head. Pectoral very small, its length being only one-third of the width of the orbit. The ventral rays are arranged in the same direction with the anal rays, and continuous with them. Vent entirely on the left side. Yellowish-olive, with fourteen brown cross-bands, as broad as the interspaces, which again are crossed by narrow brown bands. The first band crosses the snout, the second and third the eye; all extend over the dorsal and anal. Caudal with three brown cross-bands, the posterior of which occupies the hinder third of the fin. Tips of the rays of the vertical fins white.

29. SOLEOTALPA.

Eyes rudimentary, on the right side. Mouth unsymmetrical, narrow, narrower on the left side than on the right; teeth minute, on the blind side only. Dorsal and anal rays scaly, simple; the dorsal fin commences on the extremity of the snout, and terminates at the root of the caudal. Pectorals none. Right ventral contiguous with the anal; the left rudimentary. Scales small, ctenoid; lateral line straight. Gill-opening exceedingly narrow.

West Indies.

1. **Soleotalpa unicolor.**

D. 76. A. 57. V. dextr. 5, sin. 2. L. lat. 92.

Uniform brownish-grey.

West Indies.

a. Three inches long. Purchased of Mr. Scrivener.

Description.—Body very flat and thin, its height being contained twice and three-fourths in the total length (without caudal), the length of the head four times and a third. The upper part of the snout is dilated, bent downwards like an aquiline nose, the end covering the symphysis of the mandibles; the cleft of the mouth is curved, the lower eye being immediately above its angle. The eyes are mere points, rather distant from each other. The gill-opening is reduced to a very small slit, the gill-membrane being attached to the sides of the throat. The dorsal fin commences on the extremity of the snout and terminates at the root of the caudal; its rays are simple, and each is accompanied by a series of very small ctenoid scales; the longest rays are not quite half as long as the head, and occupy the middle and the third quarter of the fin. Caudal quite free, as long as the head, somewhat pointed. The right ventral appears as a mere continuation of the anal; the left is reduced to two minute rays near the vent. The scales on both sides are ctenoid, those on the neck and on the chin being twice the size of those on the body.

30. APIONICHTHYS.

Apionichthys, *Kaup in Wiegm. Arch.* 1858, p. 104.

"Pear-shaped in habit; caudal pointed; flat on the coloured side.

swollen in the lower half and on the blind side. Snout falciform, covering the symphysis of the mandibles; lower lip with nine cilia. Eyes on the right side, small, like points; before them only one nostril in a large tube, which is fringed anteriorly. Pectorals none. The right ventral extends from the chin to the anal, with which it is united. The left ventral rudimentary. The vertical fins are not distinct from the caudal, being similar in this respect to *Synaptura*. All the rays simple. Gill-opening very narrow."

The locality whence this fish has been obtained is not mentioned, nor the species (*A. dumerilii*) described.

To this genus, perhaps, belongs *Pleuronectes plagiusa*, L. Syst. Nat. i. p. 455, and Bl. Schn. p. 152.—South Carolina.

31. AMMOPLEUROPS.

Eyes on the left side; pectorals none; vertical fins confluent. Scales ctenoid, deciduous, of moderate size; one lateral line. Snout short, with the upper portion not produced into a hook; mouth unsymmetrical, rather narrow; teeth minute, on both sides.

Mediterranean.

1. Ammopleurops lacteus.

Plagusia lactea, *Bonap. Faun. Ital. Pesc.; Costa, Faun. Nap.* ii. p. 60. tav. 50; *Canestr. Arch. Zool.* i. p. 43. tav. 4. fig. 3.

D.+C.+A. 162–178. V. 4.

Two nostrils in front of the lower eye; lips not fringed. The height of the body is two-sevenths of the total length, the length of the head nearly one-fifth. Uniform whitish; vertical fins with some spots along the base.

Mediterranean.

32. APHORISTIA.

Plagusia, sp., *Cuv.*
Aphoristia, *Kaup in Wiegm. Arch.* 1858, p. 106.

Eyes on the left side; pectorals none; only the left ventral is present; vertical fins confluent. Scales ctenoid, of moderate size; lateral line none. Snout short, with the upper portion not produced into a hook; mouth unsymmetrical, rather narrow; teeth minute, on the right side only. Gill-opening very narrow.

Atlantic coasts of tropical America.

1. Aphoristia ornata.

Brown, Jamaica, p. 445. no. 1.
Achirus ornatus, *Lacép.* iv. pp. 659, 663.
Plagusia ornata, *Cuv. Règne Anim.*
—— brasiliensis, *Agass. in Spix, Pisc. Bras.* p. 89. tab. 50; *Casteln. Anim. Nouv. Poiss.* p. 79. pl. 41. fig. 2 (not good).

Plagusia tessellata, *Quoy & Gaim. Voy. Uran. Zool.* p. 240; *Guich. in Ramon de la Sagra, Hist. Cuba, Poiss.* p. 169.
Aphoristia ornata, *Kaup, l. c.*

D. 96. A. 80. C. 10. V. 4. L. lat. 95.

Ventral fin contiguous with the anal. A small nostril above the upper lip, in front of the lower eye *. Eyes subcontiguous, the upper somewhat in advance of the lower. Lips not fringed. The length of the snout is one-fourth of that of the head. The height of the body is contained thrice and three-fourths in the total length, the length of the head five times and three-fourths. Brownish, uniform or with irregular dark cross-bands.

Atlantic coasts of tropical America.

a–b. Fine specimens. San Domingo. Purchased of Mr. Cuming.
c. Adult: skin. Jamaica. From Dr. Parnell's Collection.
d–e. Adult and half-grown: not good state. From the Haslar Collection.

33. PLAGUSIA.

Plagusia, pt., *Cuv. Règne Anim.*
Plagusia, *Kaup in Wiegm. Arch.* 1858, p. 108.

Eyes on the left side; pectorals none; vertical fins confluent. Scales ctenoid, small; lateral line on the left side double or triple. Upper part of the snout produced backwards into a long hook, covering the mandible; mouth unsymmetrical, rather narrow; lips of the coloured side with tentacles; teeth minute, on the right side only. One nostril, on the left side, before the angle of the lower orbit; none between the eyes. Gill-opening very narrow.

East Indies.

1. Plagusia marmorata.

? Plagusia dipterygia, *Rüpp. Atl. Fische*, p. 123. taf. 31. fig. 3.
Plagusia marmorata, *Bleek. Verh. Batav. Genootsch.* xxiv. *Pleuron.* p. 20, or *Natuurk. Tydschr. Nederl. Ind.* i. p. 411.

D. 99–106. A. 75–85. C. 10. V. 4. L. lat. 100.

The height of the body is more than one-fourth of the total length, the length of the head two-ninths. Two lateral lines on the left side, separated by seventeen longitudinal series of scales at the point of their greatest distance. The length of the snout is two-fifths of that of the head. Rostral hook very long, extending far behind the lower eye. Brownish, finely marbled with dark brown.

? Red Sea. East Indies.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.
b. Adult. East Indies. Presented by General Hardwicke.
c. Adult. From the Haslar Collection.

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* Hr. Kaup speaks of an upper nostril between the eyes, as in his genus *Arelia*. I can only find a small papilla without opening in front of the interorbital space, which is exceedingly narrow

2. Plagusia bilineata.

? Pleuronectes bilineatus, *Bl.* tab. 188; *Bl. Schn.* p. 158.
? *Russell*, pl. 74.
? Plagusia bilineata, *Cuv. Règne Anim.* (not *Bl.*).
Plagusia bilineata, *Cant. Catal.* p. 227.
—— blochii, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 21, or *Nat. Tydschr. Nederl. Ind.* i. p. 411.

D. 96–97. A. 70–73. C. 8. L. lat. 85.

The height of the body is rather more than the length of the head, and one-fourth of the total. Two lateral lines on the left side, separated by twelve or thirteen longitudinal series of scales at the point of their greatest distance. The length of the snout is contained twice and a third in that of the head. The rostral hook extends to the vertical from the posterior margin of the eye. Reddish-brown.

Malayan Peninsula. East Indian Archipelago.

a. Seven inches long: skin. Pinang. From Dr. Cantor's Collection.—Type of his *Pl. bilineata*.
b. Adult. From Dr. P. v. Bleeker's Collection, as *Pl. bilineata*.

3. Plagusia japonica.

Schleg. Faun. Japon. Poiss. p. 187. pl. 95. fig. 2; *Bleek. Act. Soc. Sc. Indo-Nederl.* iii. *Japan*, iv. p. 26.

D. 110. A. 88. C. 8. V. 4. L. lat. 100.

The height of the body is contained four times and a sixth in the total length, the length of the head four times and five-sixths. Three lateral lines on the left side. The angle of the mouth is much nearer to the gill-opening than to the extremity of the snout. The rostral hook terminates below the eye. Brownish-green, with small scattered black spots; fins edged with yellow.

Japan.

34. CYNOGLOSSUS *.

Plagusia, pt., *Cuv. Règne Anim.*
Cynoglossus et Achirus, *Ham. Buch.*
Cantoria, Arelia, Trulla, et Icania, *Kaup in Wiegm. Arch.* 1858, p. 106, etc.

Eyes on the left side; pectorals none; vertical fins confluent. Scales ctenoid; lateral line on the left side double or triple; upper part of the snout produced backwards into a hook; mouth unsymmetrical, rather narrow; lips not fringed. Teeth minute, on the right side only. Gill-opening very narrow.

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* 1. Jerree potoo, *Russ.* i. p. 57. tab. 73.—Plagusia potous, *Cuv. Règne Anim.*—Coromandel.
2. Plagusia macrorhynchus, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleur.* p. 22, or *Nat. Tydschr. Nederl. Ind.* i. p. 413.—Arelia macrorhynchus, *Bleek. Enum.* p. 185.—Java.
3. Plagiusa auro-limbata, *Richards. Ichth. Chin.* p. 280.—China.
4. —— nigro-labeculata, *Richards. l. c.*—China.
5. —— grammica, *Richards. l. c.*—The typical specimen is in the Collection of the Cambridge Philosophical Society.
6. —— flavosquamis, *Richards. l. c.* p. 281.—China.

East Indian Seas, round the Cape of Good Hope, to the west coast of Africa. Entering fresh waters.

I. Two nostrils on the left side, one of which is situated between the eyes (*Arelia*, Kaup).
  A. Three lateral lines on the left side, p. 493.
  B. Two lateral lines on the left side, p. 496.
II. Two nostrils in front of the lower eye, the lower nostril being wider than the upper: *Cantoria*, Kaup, p. 502.
III. Only one nostril in front of the lower eye: *Trulla*, Kaup, p. 503.
IV. No conspicuous nostril: *Icania*, Kaup, p. 504.

I. Two nostrils on the left side, one of which is situated between the eyes.

A. Three lateral lines on the left side.

1. Cynoglossus kopsii.

Plagusia kopsii, *Bleek. Nat. Tydschr. Nederl. Ind.* ii. p. 494, and vii. p. 99, or *Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 31.
Arelia kopsii, *Bleek. Enum.* p. 184.

D. 101–102. A. 76–79. C. 8. V. 4. L. lat. 55.

Three lateral lines on the left side, and one on the right. Two nostrils: one between the eyes, and the other above the cleft of the mouth. Eyes subcontiguous. Lips not fringed. The angle of the mouth is nearer to the extremity of the snout than to the gill-opening; the rostral hook extends backwards nearly to the vertical from the front margin of the eye. The height of the body is a little less than one-fourth of the total length, the length of the head one-fifth. Greyish; body and fins with numerous oblong brown spots. (*Bl.*)

East Indian Archipelago.

a. Very bad state. From Dr. P. v. Bleeker's Collection.

2. Cynoglossus waandersii.

Plagusia waandersii, *Bleek. Sumatra*, iv. p. 98.
Arelia waandersii, *Bleek. Enum.* p. 185.

D. 90. A. 68. C. 10. V. 4. L. lat. 80.

Three lateral lines on the left side, one on the right. Two nostrils: one between the eyes, the other above the cleft of the mouth. The width of the interorbital space is less than the diameter of the eye. Lips not fringed. The angle of the mouth is much nearer to the extremity of the snout than to the gill-opening; the rostral hook does not extend to below the eye. The height of the body is contained thrice and three-fourths in the total length, the length of the head five times. Golden-olive-coloured, with irregular brownish spots. (*Bl.*)

Sumatra.

3. Cynoglossus feldmanni.

Plagusia feldmanni, *Bleek. Borneo*, vii. p. 455.
Arelia feldmanni, *Bleek. Enum.* p. 184.

D. 100–104. A. 78. C. 10. V. 4. L. lat. 90.

Three lateral lines on the left side, the upper and lower separated from the middle by seventeen or eighteen series of scales; one on the right side. Two nostrils: one between the eyes, and the other above the cleft of the mouth. Eyes subcontiguous; lips not fringed. The angle of the mouth is rather nearer to the gill-opening than to the extremity of the snout; the rostral hook terminates in the vertical from the front margin of the eye. The height of the body is contained four times and a third in the total length, the length of the head five times. Brownish, with irregular darker spots.

Rivers of Pengaron.

a. From Dr. P. v. Bleeker's Collection.

4. Cynoglossus abbreviatus.

Plagusia abbreviata, *Gray, Ill. Ind. Zool.*
Arelia abbreviata, *Kaup, l. c.*

D. 122. A. 92. C. 10. V. 4. L. lat. 120.

One lateral line on the right side, three on the left: the dorsal and ventral lines separated from the middle by about nineteen longitudinal series of scales, when counted at the end of the abdominal cavity. Only one ventral is present, united with the anal. Two nostrils: one between the eyes, and the other before the lower angle of the lower eye. The upper eye is slightly in advance of the lower; the width of the interorbital space is rather more than that of the orbit. Lips not fringed. The length of the snout is one-third of that of the head. The rostral hook terminates behind the symphysis of the mandibles. The height of the body is contained thrice and three-fourths in the total length, the length of the head four times and two-thirds. Brown; fins blackish, edged with white.

Chinese Seas.

a–b. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—Types of the species.
c. Fine specimen. Amoy.

5. Cynoglossus trigrammus.

D. 134. A. 107. C. 10. V. 4. L. lat. 140.

Three lateral lines on the left side; when counted at the end of the abdominal cavity, the upper line is separated from the middle by twenty-one longitudinal series of scales, the middle from the lower by twenty-four. One lateral line on the right side. One ventral, united with the anal. Two nostrils: one anteriorly between the eyes, the other before the lower angle of the lower orbit. The upper eye is slightly in advance of the lower; the width of the interorbital space is rather less than the diameter of the eye, which is one-thirteenth of the length of the head. Lips not fringed. The length of the snout is contained twice and three-fourths in that of the head. The angle of the mouth is somewhat behind the vertical from the posterior margin of the eye, and a little nearer to the extremity of the snout than to the gill-opening. The rostral hook terminates below the symphysis of the mandible. The height of the body is contained four times and two-thirds in the total length, the length of the head five times and one-third. Brownish, with several irregular black blotches on the opercles, the trunk, and front part of the tail.

China.

a. Seven inches and a half long. From the Haslar Collection.
b. Adult. China.

6. Cynoglossus microlepis.

Plagusia microlepis, *Bleek. Nat. Tydschr. Nederl. Ind.* i. p. 413, and vii. p. 99, or *Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 31.
Arelia microlepis, *Bleek. Enum.* p. 184.

D. 123. A. 97. V. 4. L. lat. 150.

Three lateral lines on the left, one on the right side. Two nostrils: one between the eyes, and the other above the cleft of the mouth. Lips not fringed. The cleft of the mouth extends behind the eye, and is nearer to the gill-opening than to the extremity of the snout. Rostral hook produced backwards to behind the eye. Ventral and anal united. The height of the body is contained five times in the total length, the length of the head five times and a half. Greyish-brown. (*Bl.*)

Rivers of Bandjermassing.

7. Cynoglossus xiphoideus.

D. 120. A. 98. V. 4. L. lat. 135.

Three lateral lines on the left side, the upper and lower separated from the middle by twenty or twenty-one longitudinal series of scales; a single line on the right side. Two nostrils: one between the posterior parts of the eyes, the other in front of the lower eye. Eyes separated by a concave space, the width of which is more than that of the orbit; the upper eye considerably in advance of the lower. Lips not fringed. The length of the snout is contained twice and a third in that of the head, the angle of the mouth being behind the vertical from the posterior margin of the eye, and nearer to the gill-opening than to the end of the snout. The rostral hook terminates below the front margin of the eye. The height of the body is contained four times and two-thirds in the total length, the length of the head five times and a half. The height of the dorsal and anal fins is two-sevenths of that of the body. Uniform brownish-grey.

Siam.

a–b. Six to nine inches long. From M. Mouhot's Collection.

B. Two lateral lines on the left side.

8. Cynoglossus macrolepidotus.

Plagusia macrolepidota, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 25, or *Nat. Tydschr. Nederl. Ind.* i. p. 415.
Arelia macrolepidota, *Bleek. Enum.* p. 184.

D. 111–114. A. 86–89. V. 4. L. lat. 50.

Two lateral lines on the left side, one on the right. Two nostrils: one between the eyes, and the other above the cleft of the mouth. The width of the interorbital space equals that of the orbit. Lips not fringed. The angle of the mouth is in the middle of the length of the head; rostral hook short. The height of the body is contained four times and a third to four times and a half in the total length, and nearly equal to the length of the head. Greyish-brown; fins yellow.

Coasts of Java, Sumatra, and Banka.

a. From Dr. P. v. Bleeker's Collection.

9. Cynoglossus melampetalus.

Plagiusa melampetala, *Richards. Ichth. Chin.* p. 281.

D. 124. A. 100. C. 12. V. 4. L. lat. 60.

Two lateral lines on the left side, separated by seven longitudinal series of scales at the point of their greatest distance; one lateral line on the blind side. Two nostrils: one anteriorly between the eyes, the other above the cleft of the mouth. Interorbital space very narrow, one-third of the horizontal diameter of the eye, which is one-eighth or one-ninth of the length of the head. Lips not fringed. The length of the snout is contained twice and two-thirds in that of the head; the angle of the mouth is situated vertically below the posterior margin of the orbit, before the middle of the length of the head; the rostral hook terminates behind the symphysis of the mandibles. The height of the body equals the length of the head, and is contained four times and two-thirds in the total length. Brownish, the posterior part of the fins blackish.

China.

a. Fine specimen, 10½ inches long. China. Presented by Vice-Admiral Sir E. Belcher, C.B.
b, c. Young. China. Presented by Vice-Admiral Sir E. Belcher, C.B.

10. Cynoglossus oligolepis.

Plagusia oligolepis, *Bleek. Java,* ii. p. 445.
Arelia oligolepis, *Bleek. Enum.* p. 185.

D. 129. A. 95. C. 12. V. 4. L. lat. 68.

Two lateral lines on the left side, separated by eight series of scales; one on the right side. Two nostrils: one between the eyes, the other above the cleft of the mouth. Interorbital space very narrow, its width being less than one-half of that of the orbit. Lips not fringed. The angle of the mouth is somewhat nearer to the gill-opening than to the extremity of the snout; rostral hook not extending to below the eye. The height of the body is contained four times and three-fourths in the total length, the length of the head four times and two-fifths. Light violet-rose-coloured, each scale with a transverse streak, and with two to four dots of violet colour; fins with violet dots.

Batavia.

a. Adult. From Dr. P. v. Bleeker's Collection.

11. Cynoglossus sumatrensis.

Plagusia sumatrana, *Bleek. Sumatra*, iii. p. 529.
Arelia sumatrensis, *Bleek. Enum.* p. 185.

D. 104. A. 77. C. 8–10. L. lat. 70.

Two lateral lines on the left side, one on the right. Two nostrils: one between the eyes, the other above the cleft of the mouth. The width of the interorbital space is less than that of the orbit. Lips not fringed. The angle of the mouth is nearer to the gill-opening than to the end of the snout; the rostral hook extends to below the eye. The height of the body is contained four times and a third in the total length, the length of the head five times and a third. Greenish, clouded with brownish. (*Bl.*)

Sumatra (Benkulen).

a. Bad state. From Dr. P. v. Bleeker's Collection.

12. Cynoglossus kaupii.

Arelia kaupii, *Bleek. Act. Soc. Sc. Indo-Nederl.* vi. *Sumatra*, viii. p. 73.

D. 107. A. 82. C. 12. V. 4. L. lat. 75.

Two lateral lines on each side. Two nostrils: one between the eyes, the other before the angle of the lower orbit. The width of the interorbital space equals the diameter of the eye. Lips not fimbriated. The angle of the mouth is rather nearer to the gill-opening than to the extremity of the snout; rostral hook short. The height of the body equals the length of the head, and is contained four times and a third to four times and a quarter in the total length. Olive, with numerous brownish longitudinal stripes. (*Bl.*)

Benkulen.

Pleuronectes arel, Bl. Schn. p. 159, or *Arelia schneideri*, Kaup, *l. c.* appears to be closely allied to this species.

13. Cynoglossus quadrilineatus.

Achirus bilineatus, *Lacép.* iv. pp. 659, 663.
Plagusia bilineata, *Rüpp. Atl. Fische*, p. 123.
—— quadrilineata, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 21, or *Natuurk. Tydschr. Nederl. Ind.* i. p. 412.
Arelia quadrilineata, *Kaup in Wiegm. Arch.* 1858. p. 107

D. 102–112. A. 83–86. C. 10. V. 4. L. lat. 95.

Two lateral lines on each side, separated in the middle by about fourteen longitudinal series of scales. Two nostrils: one between the eyes, and the other before the lower angle of the lower eye. The upper eye somewhat in advance of the lower. Lips not fimbriated. The length of the snout is contained twice and two-thirds in that of the head. The rostral hook just covers the symphysis of the mandibles. The height of the body is somewhat less than one-fourth of the total length, the length of the head one-fifth. Uniform brownish; fins yellowish; a blackish spot on the operculum.

East Indian Archipelago.

a. Fine specimen. Amboyna. Purchased of Mr. Frank.

14. **Cynoglossus lida.**

Plagusia lida, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 23, or *Natuurk. Tydschr. Nederl. Ind.* i. p. 413.
? Plagusia polytænia, *Bleek. Sumatra,* iii. p. 529.
Arelia lida, *Bleek. Enum.* p. 184.
? Arelia polytænia, *Bleek. Enum.* p. 185.

D. 103–104. A. 82–83. C. 10–12. V. 4. L. lat. 90.

Two lateral lines on the left side, separated by thirteen series of scales; one on the right. Ventral not united with the anal. Two nostrils: one between the eyes, and the other above the cleft of the mouth. The upper eye is in advance of the lower; the width of the interorbital space is less than that of the orbit. Lips not fringed. The angle of the mouth is nearer to the gill-opening than to the end of the snout; the rostral hook extends to below the eye. The height of the body is one-fourth or two-ninths of the total length; the length of the head equals its height, and is two-ninths or one-fifth of the total. Brown.

Coasts of Java and Celebes.

a. Six inches long. From Dr. P. v. Bleeker's Collection.
b. Four and a half inches long. From Dr. P. v. Bleeker's Collection, as *Arelia polytænia*.—L. lat. 85.

15. **Cynoglossus borneensis.**

Plagusia borneensis, *Bleek. Act. Soc. Sc. Indo-Nederl.* v. *Borneo,* xii. p. 6.
Arelia borneensis, *Bleek. Enum.* p. 184.

D. 112. A. 88. C. 12. V. 4. L. lat. 100.

Two lateral lines on the left side, a single one on the right. Two nostrils: one between the eyes, and the other above the cleft of the mouth. The diameter of the eye is one-ninth of the length of the head, and two-thirds of the width of the interorbital space. Lips not fringed. The angle of the mouth is in the middle of the length of the head, below the posterior margin of the orbit. The rostral hook does not extend to below the eye. The height of the body is contained four times and two-thirds in the total length, the length of the head five times. Greenish, with three indistinct violet longitudinal bands. (*Bl.*)

Singkawang.

16. Cynoglossus oxyrhynchus.

Plagusia oxyrhynchos, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 26, or *Natuurk. Tydschr. Nederl. Ind.* i. p. 416.
Arelia oxyrhynchos, *Bleek. Enum.* p. 185.

D. 98–105. A. 77–84. V. 4. L. lat. 80–90.

Two lateral lines on the left side, separated in the middle by thirteen longitudinal series of scales; a single lateral line on the blind side. Two nostrils: one between the eyes, and the other above the cleft of the mouth. Eyes subcontiguous, the upper considerably in advance of the lower. Lips not fringed. The angle of the mouth is in the middle of the length of the head; rostral hook short. The height of the body is one-fourth, or rather less than one-fourth, of the total length, the length of the head one-fifth. Brown.

Java, Borneo, and Amboyna.

a. Young. From Dr. P. v. Bleeker's Collection.

17. Cynoglossus bengalensis.

Plagusia bengalensis, *Bleek. Verhand. Batav. Genootsch.* xxv. *Nalez. Beng. & Hindost.* p. 152. tab. 6. fig. 3.

D. 103. A. 80. C. 10. V. 4. L. lat. 90.

Two lateral lines on the left side, separated in the middle by about thirteen longitudinal series of scales; a single lateral line on the blind side. Two nostrils: one between the eyes, and the other before the lower angle of the lower eye. Head as long as high. Interorbital space narrower than the orbit; eyes very small, the upper in advance of the lower. Lips not fringed. The length of the snout is two-fifths of that of the head; the rostral hook terminates behind the symphysis of the mandibles. The height of the body is two-sevenths, or rather more than one-fourth, of the total length, the length of the head one-fifth. The height of the dorsal and anal fins is rather less than one-fourth of that of the body. Brown, with more or less distinct darker transverse spots.

Ganges.

a. Adult. Ganges. Presented by G. R. Waterhouse, Esq.
b. Adult. Ganges. From the Collection of the Zoological Society.
c, *d–e*. Half-grown and young.

18. Cynoglossus brachyrhynchus.

Plagusia brachyrhynchus, *Bleek. Verhand. Batav. Gen.* xxiv. *Pleuron.* p. 24, or *Natuurk. Tydschr. Nederl. Ind.* i. p. 414.
Arelia brachyrhynchus, *Bleek. Enum.* p. 184.

D. 96–99. A. 73–75. C. 10. V. 4. L. lat. 80–100.

Two lateral lines on the left side, one on the right. Two nostrils: one between the eyes, and the other above the cleft of the mouth. Eyes subcontiguous, the upper scarcely in advance of the lower. Lips not fringed; the angle of the mouth is nearer to the extremity of the snout than to the gill-opening; rostral hook short. The height of the body is contained thrice and three-fourths or four times in the total length, the length of the head five times or five times and a quarter. The height of the dorsal and anal fins is one-third of that of the body. Brownish, with darker spots. (*Bl.*)

Java, Singapore, and Celebes.

? *a*. Four and a half inches long. From Dr. P. v. Bleeker's Collection, as *Arelia brachyrhynchus*.—The height of the body of this specimen is contained thrice and a quarter in the total length.

19. **Cynoglossus puncticeps.**

Plagiusa puncticeps, *Richards. Ichth. Chin.* p. 280.
Plagusia javanica, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 24, or *Natuurk. Tydschr. Nederl. Ind.* i. p. 414.

D. 93. A. 71. C. 12. V. 4. L. lat. 90.

Two lateral lines on the left side, separated at the point of their greatest distance by seventeen or eighteen longitudinal series of scales; a single lateral line on the blind side. Two nostrils: one between the eyes in front, the other in front of the angle of the lower orbit. Eyes close together, the upper in advance of the lower. Lips not fringed. Head higher than long. The length of the snout is contained twice and three-fourths in that of the head, the angle of the mouth being below the middle of the eye, much nearer to the extremity of the snout than to the gill-opening. The rostral hook terminates behind the symphysis of the mandibles. The height of the body is two-sevenths of the total length, the length of the head one-fifth. The height of the dorsal and anal fins is less than one-fourth of that of the body. Brownish, with irregular dark-brown spots on the head and body: fins light-coloured; every fourth or fifth ray of the dorsal and anal fins is brown.

Chinese Seas. East Indian Archipelago.

a. Four and a half inches long. China. From Dr. Cantor's Collection.
b, *c*, *d*, *e*, *f*–*g*. Adult and half-grown. China.
h. From Dr. P. v. Bleeker's Collection, as *Arelia javanica*.

20. **Cynoglossus brevis.**

D. 95. A. 75. V. 4. L. lat. 96.

Two lateral lines on the left side, separated at the point of their greatest distance by seventeen longitudinal series of scales; a single lateral line on the blind side. Two nostrils: one between the eyes in front, the other in front of the angle of the lower orbit. Eyes close together, the upper slightly in advance of the lower. Lips not fringed. The length of the snout is contained thrice and a fourth in that of the head, the angle of the mouth being below the middle of the eye, much nearer to the extremity of the snout than to the gill-opening. The rostral hook terminates below the symphysis of the mandibles. The height of the body is contained thrice and a fourth in the total length, the length of the head five times and two-thirds. The height of the dorsal and anal fins is less than one-fifth of that of the body. Brownish, with blackish-brown transverse spots; many rays of the vertical fins blackish.

Ganges.

a. Four and a third inches long. Ganges. From the Collection of the Zoological Society.

21. **Cynoglossus elongatus.**

Plagusia potous, *Bleek. Verhand. Batav. Genootsch.* xxiv. *Pleuron.* p. 23.
—— lingua, *Cant. Catal.* p. 233.
Arelia lingua, *Kaup, l. c.*

D. 137. A. 107. C. 10. V. 4. L. lat. 95.

Two lateral lines on the left side, separated by about eight longitudinal series of scales at the point of their greatest distance. [Both ventrals are present ?], the left being the more developed, and contiguous with the anal. Two nostrils: one between the eyes, and the other before the lower angle of the lower eye. The upper eye is in advance of the lower; the width of the interorbital space equals that of the orbit. Lips not fringed. The length of the snout is contained twice and a third in that of the head. The rostral hook terminates behind the symphysis of the mandibles. The height of the body is contained six times and two-thirds in the total length, the length of the head five times and a third. Reddish-brown, with distant, rounded, irregular blackish-brown blotches; caudal black.

East Indian Seas.

a. Adult: skin. Pinang. From Dr. Cantor's Collection.

22. **Cynoglossus lingua.**

Cynoglossus lingua, *Ham. Buch. Fish. Gang.* pp. 32, 365.

D. 142. A. 112. C. 8. V. 4. L. lat. 105.

Two lateral lines on the left side, separated by thirteen longitudinal series of scales at the point of their greatest distance. Right side with cycloid scales and with a single inconspicuous lateral line One ventral, contiguous with the anal. Two nostrils: one above the lower eye, the other in front of its lower angle. The upper eye is slightly in advance of the lower; the width of the interorbital space is a little less than that of the orbit, which is one-fourteenth of the length of the head. Lips not fringed. The length of the snout is contained twice and a fourth in that of the head. The cleft of the mouth extends behind the eyes, its angle being much nearer to the gill-opening than to the extremity of the snout. The rostral hook terminates behind the symphysis of the mandibles. The height of the body is contained six times in the total length, the length of the head five times and a quarter. Reddish-brown, uniform or clouded with darker.

Mouth of the Ganges.

a. Eleven inches long. Ganges. From the Collection of the Zoological Society.

b. Adult: skin. Ganges. Presented by G. R. Waterhouse, Esq.—Probably type of the species.

23. Cynoglossus melanopterus.

? Plagusia monopus, *Bleek. Verhand. Batav. Genootsch.* xxii. *Bali*, p. 11.
Plagusia melanoptera, *Bleek. l. c.* xxiv. *Pleuron.* p. 25, or *Natuurk. Tydschr. Nederl. Ind.* i. p. 415.
Arelia ceratophrys, *Kaup, l. c.*

D. 114–118. A. 92–95. C. 8–10. V. 4–5. L. lat. 110–120.

Two lateral lines on the left side, separated by seventeen longitudinal series of scales, and a single one on the right. Two nostrils, one in the middle before the eyes. Eyes situated on a pair of styliform prominences, small, subcontiguous, the upper in advance of the lower. Lips not fringed. Rostral hook short; the angle of the mouth is nearer to the extremity of the snout than to the gill-opening. The height of the body is contained four times and a half or four times in the total length, the length of the head five times or five times and a third. Brown; dorsal and anal fins with a broad black margin posteriorly.

Java, Sumatra, and Bali.

a. From Dr. P. v. Bleeker's Collection.

24. Cynoglossus senegalensis.

Arelia senegalensis, *Kaup in Wiegm. Arch.* 1858, p. 108.

D. 133. A. 109. C. 10. V. 4. L. lat. 140.

Two lateral lines on the left side, separated by eighteen longitudinal series of scales at the point of their greatest distance. Two nostrils: one between the eyes, the other before the lower angle of the lower orbit. Lips not fringed. The length of the snout is contained twice and two-thirds in that of the head; the rostral hook terminates behind the symphysis of the mandibles. The height of the body is a little more than the length of the head, which is one-sixth of the total length. Uniform greenish-olive.

West Africa.

a–c. Eight inches long. Presented by A. Murray, Esq.

II. Two nostrils, in front of the lower eye, the lower nostril being wider than the upper.

25. Cynoglossus cantoris.

Plagusia potous, *Cant. Catal.* p. 235 (not syn.).
—— cantori, *Bleek. Enumer.* p. 185.
Cantoria pinangensis, *Kaup in Wiegm. Arch.* 1858, p. 106.

D. 126–127. A. 94–95. C. 10. V. 4. L. lat. 70.

Two lateral lines on each side, separated in the middle by seven or eight longitudinal series of scales. Only the left ventral is present, composed of four rays and contiguous with the anal. Two nostrils, one of which is very small, above the upper lip, in front of the lower eye. The upper eye is scarcely in advance of the lower; the width of the interorbital space equals that of the orbit. Lips not fringed.

The length of the snout is two-fifths of that of the head. The rostral hook just covers the symphysis of the mandibles. The height of the body is contained five times and a half in the total length, the length of the head five times and a third. Copper-red, opercles blackish; fins minutely dotted with brown.

Malayan Peninsula.

a–b. Adult and half-grown: skin. Singapore. From Dr. Cantor's Collection—Types of the species.

III. Only one nostril, in front of the lower eye.

26. **Cynoglossus capensis.**

Trulla capensis, *Kaup in Wiegm. Arch.* 1858, p. 109.

D. 102. A. 76. C. 9. V. 4.

Three lateral lines on the left side; only one nostril, in front of the lower eye; lips not fringed. (*Kaup.*)

Cape of Good Hope.

27. **Cynoglossus trulla.**

Plagusia trulla, *Cant. Catal.* p. 231.
Trulla cantori, *Kaup, l. c.*

D. 109–111. A. 80–86. C. 12. V. 4. L. lat. 117.

Two lateral lines on the left side, separated by nineteen longitudinal series of scales at the point of their greatest distance. One nostril, in front of the lower eye; none between the eyes. The width of the interorbital space is rather more than that of the orbit; a bony protuberance below the upper eye. Lips not fringed; the length of the snout is contained twice and three-fourths in that of the head; rostral hook short. The height of the body is contained four times and a half to four times and two-thirds in the total length, the length of the head five times and a fourth. Reddish-brown.

Malayan Peninsula.

a–b. Adult: skins. Pinang. From Dr. Cantor's Collection.—Types of the species.

28. **Cynoglossus grandisquamis.**

Plagusia grandisquamis, *Cant. Catal.* p. 232.
Trulla grandisquamis, *Kaup, l. c.*

D. 116. A. 88. C. 10. V. 4. L. lat. 59.

Two lateral lines on the left side, separated by six longitudinal series of scales at the point of their greatest distance. One nostril, in front of the lower eye; none between the eyes. Eyes close together, a bony protuberance above the lower. Lips not fringed; the length of the snout is contained twice and two-thirds in that of the head; rostral hook short. The height of the body equals the length of the head, and is contained five times and a third in the total.

Reddish-brown; a blackish band along and near to the base of the dorsal and anal fins.

Pinang.

a. Skin. From Dr. Cantor's Collection.—Type of the species.

IV. No conspicuous nostril.

29. Cynoglossus hamiltonii.

Achirus cynoglossus, *Ham. Buch. Fish. Gang.* pp. 132, 373.
Plagusia cynoglossa, *Cant. Catal.* p. 229.
Icania cynoglossa, *Kaup, l. c.*

D. 100–102. A. 76–78. C. 10. V. 4. L. lat. 80.

Two lateral lines on the left side, separated by thirteen longitudinal series of scales at the point of their greatest distance. No conspicuous nostril; eyes very small; lips not fringed. The length of the snout is one-third of that of the head; rostral hook short. The height of the body is contained four times and two-thirds in the total length, the length of the head five times and two-thirds. Reddish-brown, with irregular brownish-black spots; sometimes a portion of the spots confluent into seven or eight cross-bands.

Ganges. Pinang.

a–b. Adult: skins. Pinang. From Dr. Cantor's Collection.

ADDENDA ET CORRIGENDA.

Page 58. **Parma squamipinnis.**

c. Fine specimen. Sydney. Presented by G. Krefft, Esq.

The ground-colour of this species during life is greenish-black.

Page 80. **Crenilabrus melops.**

π. Young. Båhuslän. Presented by Hr. A. W. Malm.

Page 91. **Acantholabrus palloni.**

g. Fine specimen. Madeira. Presented by J. Y. Johnson, Esq.

Page 93. **Centrolabrus trutta.**

Vertebræ 14/18.

d. Adult: skeleton. Madeira. Purchased of Mr. Stevens.

Page 94. **Chœrops macrodon.**

Add to the synonymy:—

Chœrops macrodon, *Bleek. Atl. Ichth.* p. 162. tab. 47. fig. 1.

Page 94. **Chœrops ommopterus.**

Add to the synonymy:—

Chœrops schönleinii, *Bleek. Atl. Ichth.* p. 163. tab. 46. fig. 1.

Page 95. **Chœrops leucozona.**

Add to the synonymy:—

Chœrops leucozona, *Bleek. Atl. Ichth.* p. 163. tab. 42. fig. 1.

Page 96. **Chœrops oligacanthus.**

Add to the synonymy:—

Chœrops oligacanthus, *Bleek. Atl. Ichth.* p. 164. tab. 47. fig. 2.

Page 100. **Trochocopus opercularis.**

I have recognized this species again in two specimens preserved in spirits and received by the College of Surgeons from Mauritius. One of these specimens has twelve dorsal spines; hence it becomes probable that the species is identical with *Cossyphus opercularis*, Guich. (p. 109).

Page 100.—3. **Trochocopus scrofa.**

The British Museum has received a splendid specimen of *Cossyphus scrofa* (p. 111), from Madeira, by which I have been enabled more closely to examine its characters and to ascertain that it belongs to *Trochocopus.* The base of the soft dorsal and anal is not scaly, and the scales are smaller than in *Cossyphus.*

a. Twenty-three inches long. Madeira. Presented by J. Y. Johnson, Esq.

Page 103. **Cossyphus mesothorax.**

Add to the synonymy :—

Cossyphus mesothorax, *Bleek. Atl. Ichth.* p. 159. tab. 38. fig. 4.

Page 104. **Cossyphus diana.**

Add to the synonymy :—

Cossyphus diana, *Bleek. Atl. Ichth.* p. 159. tab. 38. fig. 1.

Page 105. **Cossyphus bilunulatus.**

Add to the synonymy :—

Cossyphus bilunulatus, *Bleek. Atl. Ichth.* p. 161. tab. 38. fig. 3.

Page 106. **Cossyphus anthioides.**

Add to the synonymy :—

Cossyphus anthioides, *Günth. Ann. & Mag. Nat. Hist.* 1861, viii. p. 384; *Bleek. Atl. Ichth.* p. 160. tab. 38. fig. 2.

Page 109. **Cossyphus opercularis.**

See the note (*supra*) on *Trochocopus opercularis.*

Page 109. **Cossyphus unimaculatus.**

When the printing of this volume was nearly completed, I received from Dr. v. Bleeker a proof-sheet of a paper entitled "Notices Ichthyologiques," in which he describes this species as *Cossyphus oxycephalus.* It will depend on the time of the publication of the Journal containing that paper, which of the two names has the priority.

Page 111. **Cossyphus scrofa.**

This species belongs to the genus *Trochocopus.*

Page 115. **Labrichthys laticlavius.**

This species has two very distinct series of scales on the cheek, and sometimes (as in the typical specimen) a short, rudimentary third series, composed of one or two small scales. This third series being rudimentary or entirely absent, it will be better to arrange this species with *L. tetrica* (p. 116).

c. Fine specimen. Sydney. Presented by G. Krefft, Esq.

Page 116. Add a new species:—

8 *a*. **Labrichthys güntheri.**

Pseudolabrus güntheri, *Bleek. Not. Ichthyol.** p. 126.

D. $\frac{9}{11}$. A. $\frac{3}{10}$. L. lat. 26–27.

A posterior canine tooth; jaws with four canine teeth anteriorly. Cheek with four series of scales; tubules of the lateral line branched; the scaly sheath of the dorsal and anal fins is low. Caudal fin convex, with the lobes not produced. Rose-coloured olive, with six or seven indistinct brown cross-bands: six brown streaks radiate from the eye; a deep-blue spot between the first and third dorsal spines and at the root of the pectoral superiorly; a blue band along the middle of the dorsal and anal fins; a brownish band across the middle of the caudal. (*Bl.*)

Australia.

Page 117. **Labrichthys gymnogenis.**

c. Fine specimen. Sydney. Presented by G. Krefft, Esq.

The ground-colour during life is purplish-brown, with scattered reddish-white spots; dorsal, anal, and the paired fins red; anal with a dark band along the middle; a blackish band across the root of the pectoral; upper half of the head with brown spots, lower half reddish.

Page 120. **DUYMÆRIA.**

Add to the synonymy:—

Labrastrum, *Guich. Rev. Zool.* 1860, p. 152.

Page 144. **Platyglossus chloropterus.**

Add to the synonymy:—

Halichœres chloropterus, *Bleek. Atl. Ichth.* p. 125. tab. 35. fig. 3.

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* We have seen only a proof-sheet of this paper, and are not aware in what Journal it will be published.

Page 176. **Novacula kallosoma.**

Add to the synonymy:—

Novaculichthys kallosoma, *Bleek. Atl. Ichth.* p. 145. tab. 31. fig. 3.

Page 183. **Julis genivittata.**

I now believe that this species and *J. hebraica* (p. 186) are identical, the former representing older individuals than the latter. I have arrived at this opinion from the comparison of two very fine specimens sent by Mr. Th. Ayres from Port Natal, the larger of which ought to be referred to *J. genivittata,* the other to *J. hebraica,* although both are evidently of the same species. An experience like this must lead us to suppose that many a tropical species, based on colours alone and introduced into our system, will prove to be merely a variety.

The name *Julis hebraica* is prior to the other.

f. Nine inches long. Port Natal. From Mr. Th. Ayres's Collection. —This specimen would belong to *J. genivittata.* Head dark-violet, with the bands on the cheek obscure; no yellow cross-band behind the pectoral. Dorsal and anal fins yellow, the former with a black spot anteriorly, and with a purple band edged with violet along the whole fin, broader on the soft portion than on the spinous, and nearer to the base than to the upper margin; base of the anal fin purple. Pectoral yellow, blackish on its posterior half, and with a blackish spot superiorly in the axil. Caudal lobes considerably produced.

g. Six inches long. Port Natal. From Mr. Th. Ayres's Collection. —This specimen corresponds to the description of *J. hebraica.* Bands on the head and trunk very distinct; fins without longitudinal bands; base of the pectoral black.

Julis commersonii, Cuv. & Val., has been erroneously considered as a synonym of this species.

Page 184. **Julis bicolor.**

I have now seen several specimens of this species. It comes from Mauritius, and has been described by Valenciennes under the name of *J. commersonii,* Cuv. & Val. xiii. p. 418, which name, of course, must be retained.

Page 186. **Julis hebraica.**

See note (*supra*) on *J. genivittata.*

Page 208. Add to the doubtful species of **Scarus**:—

3. Scarus maschalespilos, *Bleek. Not. Ichthyol.** p. 122.—Surinam.

Page 210. **Scarus catesbyi.**

Add to the synonymy:—

Scarus melanotis, *Bleek. Not. Ichthyol.** p. 121.

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* See note, p. 507.

Page 241. **Odax richardsonii.**

Julis (?) *dringii*, the name of a drawing made from a fish taken in Safety Bay, South Australia (Richards. Ic. Pisc. p. 6. pl. 3. fig. 1), is perhaps identical with this species.

Page 244. **Siphonognathus argyrophanes.**

b. Sixteen inches long. King George's Sound. Presented by Dr. A. Günther.—This specimen differs from the type in having somewhat fewer fin-rays : D. $\frac{24}{20}$. A. 13. The dark lateral band has rose-coloured edges.

Page 245. **Ditrema jacksoni.**

c–d. Fine specimens. Esquimault Harbour, Vancouver Islands. Collected by J. K. Lord, Esq.*

Page 246. **Ditrema vacca.**

b. Fine specimen. Esquimault Harbour. Collected by J. K. Lord, Esq.—A. $\frac{3}{29}$.

Page 247. **Ditrema toxotes.**

b. Fine specimen, 14 inches long. Esquimault Harbour. Collected by J. K. Lord, Esq.—D. $\frac{10}{22}$. A. $\frac{3}{30}$. Scales on the cheek in five series.

Page 248. **Ditrema aggregatum.**

n–p. Fine specimens. Esquimault Harbour. Collected by J. K. Lord, Esq.

Page 249. **Ditrema minimum.**

b. Fine female specimen. Esquimault Harbour. Collected by J. K. Lord, Esq.—I see from this specimen that the lower lip is interrupted in the middle, and not continuous in its whole circuit as has been stated at p. 249.

Page 249. **Ditrema arcuatum.**

b–e. Fine specimens. Esquimault Harbour. Collected by J. K. Lord, Esq.

Page 250. **Ditrema rhodoterum.**

b–f. Fine specimens. Esquimault Harbour. Collected by J. K. Lord, Esq.

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* The whole of this splendid collection were presented by the British North-American Boundary Commission, and were made up by J. K. Lord, Esq., Naturalist to the Expedition.

Page 251. **Ditrema argenteum.**

b–e. Fine specimens (males and pregnant females). Esquimault Harbour. Collected by J. K. Lord, Esq.—These specimens are smaller (8–10 inches) than specimen *a.* from San Francisco (11 inches), and the maxillary does not extend quite so far backwards as in the latter.

Page 267. **Chromis niloticus.**

l–m. Fine specimens. Port Natal. From Mr. Th. Ayres's Collection.

These specimens do not belong to *Ch. mossambicus* or *Ch. sparrmanni,* as we might have been tempted to believe, but they agree in every respect with *Ch. niloticus.* They are called "Black-fish" in the colony.

Page 269. **Chromis tristrami.**

Specimen *c*, from Ashantee, ought to be referred to *Chromis guineensis* (p. 271).

Page 271. **Chromis guineensis.**

a. Adult. Ashantee.—D. $\frac{17}{11}$. A. $\frac{3}{9}$. L. transv. 3/11.

Note.

We have given the name of *Atypus* to an Australian fish (vol. ii. p. 64); as this name is preoccupied, we propose that of *Atypichthys.*

ALPHABETICAL INDEX.

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